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Republic of Serbia
COMMISSION FOR PROTECTION OF COMPETITION

REPORT ON
THE SECTORAL ANALYSIS OF THE
STATE OF COMPETITION IN THE
CEMENT AND CONCRETE
MARKETS OF THE REPUBLIC OF
SERBIA
IN THE PERIOD FROM 2018 UNTIL
2021

TABLE OF CONTENTS

| | |
|-----------------------------------------------------------------------------------------------|----|
| 1. SUBJECT AND GOAL OF THE ANALYSIS | 3 |
| 2. RESEARCH METHODOLOGY | 4 |
| 3. RELEVANT LEGAL FRAMEWORK | 5 |
| 4. STRUCTURE OF THE CEMENT PRODUCTION MARKET | 8 |
| 5. IMPORTING AND EXPORTING CEMENT | 11 |
| 5.1. Importing cement | 11 |
| 5.2. Exporting cement | 13 |
| 5.3. Coverage of imports by exports | 15 |
| 6. STRUCTURE OF THE CEMENT SALES MARKET | 17 |
| 7. CEMENT SELLING PRICES | 19 |
| 7.1. Average selling prices of cement and their structure | 19 |
| 7.2. Analysis of prices according to official price lists of market participants | 21 |
| 8. STRUCTURE OF CEMENT BUYERS | 23 |
| 9. DELIVERIES BY MUNICIPALITIES | 24 |
| 9.1. Delivered quantities and average selling prices by municipality | 24 |
| 9.2. Correlation analysis | 26 |
| 10. ANALYSIS OF SALES POLICIES OF CEMENT MANUFACTURERS | 28 |
| 11. PRODUCTION OF CONCRETE | 30 |
| 12. STRUCTURE OF THE CONCRETE SALES MARKET | 33 |
| 13. ANALYSIS OF THE CONCRETE SELLING PRICES | 36 |
| 14. VERTICAL CONNECTION OF THE CONCRETE MARKET AND THE CEMENT MARKET | 38 |
| 15. ASSESSMENT OF THE STATE OF COMPETITION BY THE MARKET PARTICIPANT | 40 |
| 16. ANALYSIS OF CONTRACTUAL RELATIONS | 42 |
| 16.1. Analysis of contractual relations between concrete producers and cement suppliers | 42 |
| 16.2. Analysis of contractual relations between concrete producers with customers | 42 |
| 17. CONCLUDING CONSIDERATIONS AND RECOMMENDATIONS | 43 |
| 17.1. Concluding considerations | 43 |
| 17.2. Recommendations | 46 |

1. SUBJECT AND GOAL OF THE ANALYSIS

Pursuant to the provisions of Article 21, paragraph 1, item 6) of the Law on Protection of Competition ("Official Gazette of RS", number 51/09 and 95/13 - hereinafter: the Law) the Commission for the Protection of Competition (hereinafter referred to as: the Commission) conducted a sectoral analysis of the state of competition on the cement and concrete markets in the territory of the Republic of Serbia in the period from 2018 until 2021.

Cement and concrete are indispensable raw materials in all branches of construction, from the construction of residential, business and industrial buildings, through bridges, tunnels and roads to underground works and foundations. To that end, the growth of the cement market and the vertically connected concrete market in the past ten years, recorded by official statistics, can be attributed to the growth of the construction industry and construction consumption in the Republic of Serbia. According to data of the Ministry of Construction, Transport and Infrastructure published in July 2022, over 100,000 construction sites were active in the Republic of Serbia, and the share of the construction sector in the gross domestic product is about 6%. In the coming years, further urbanization and an increase in the city's population are expected, which implies an increase in demand for the construction of a large number of residential buildings, business facilities and accompanying infrastructure, and further growth of these markets is also anticipated.

In December 2014, the Commission conditionally approved the concentration of two leading cement producers in the Republic of Serbia, Holcim and Lafarge. After the concentration, the entire business of Holcim in the Republic of Serbia was taken over by CRH (today Moravacem doo). Pursuant to the provisions of Article 21, paragraph 1, item 6) of the Law, in 2018, the Commission conducted an examination of the conditions of competition on the cement production and sales market, which covered the period from 2014 to 2017.

Given that the cement market is a market with a high degree of concentration and of oligopolistic structure, characterized by a small number of participants with relatively stable market shares, that in the fourth quarter of 2021 certain cement plants announced a 25% increase in cement prices, and that the downstream concrete market was not the subject of analysis in the previous period, the need for a detailed analysis of competition dynamics and identification of potential problems and/or limitations that exist in these vertically connected markets, from the point of view of the Law, was observed.

The subject of the research is a comprehensive analysis of the state of competition in the markets of production and sale of cement and concrete in the territory of the Republic of Serbia. This implies determining the relationship between competitors, both on the cement market (producers and importers) and on the concrete market (producers), assessment of their market share and relative strength, analysis of (contractual) relations with suppliers and customers, as well as the effects that such relations can have on the state of competition in the market. The subject analysis includes the entire production-trade cycle on both vertically connected markets, bearing in mind that a certain number of cement producers own their own concrete factories. The analysis also included the issue of commercial policy, especially rebate policy, in terms of determining the type of approved rebates, as well as the criteria for their approval.

The goal of the research, when it comes to the cement market, is to comprehensively consider the changes in the market structure and dynamics of competition in the market in question, which

took place in between the two reporting periods. When it comes to the concrete market, the main goal of the analysis is to determine the degree of vertical interdependence with the cement market as an upstream market, taking into account the existence of few vertically integrated market participants, and the effects that vertical connection can have on prices and conditions of competition in the market.

2. RESEARCH METHODOLOGY

The analysis was carried out by a combination of the desk method, which referred to the analysis of the relevant legal framework and the analysis of official statistical data, and the research method through a survey questionnaire.

The main data sources for this analysis were:

- existing legal regulation;
- data of the Republic Institute of Statistics on the production of cement and concrete;
- data from the Ministry of Finance - Customs Administration on import and export of cement;
- data from the Serbian Chamber of Commerce - Association for the Construction Industry, on active concrete producers;
- data submitted by market participants based on a semi-structured questionnaire - manufacturers and importers of cement and concrete and
- other publicly available data on the Internet.

The research was conducted in two phases. The first phase of the research included all three cement producers, two of which are also concrete producers, and in particular: Lafarge beočinska fabrika cementa d.o.o. from Beočin (hereinafter referred to as: Lafarge), Moravacem d.o.o. from Popovac (hereinafter referred to as: Moravacem) and TITAN cementara Kosjerić d.o.o from Kosjerić (hereinafter referred to as: Titan).

The first phase of the research included five cement importers (one of which is also a concrete producer), which together account for about 98% of the total cement imports in the observed four-year period, namely: NEXE BETON DOO NOVI SAD from Veternik (hereinafter referred to as: Nexe), CEMEX SRB DOO from Niš (hereinafter referred to as: Cemex), INTERNORMA d.o.o. from Novi Pazar (hereinafter referred to as: Internorma), REX TRANS d.o.o. from Arilje (hereinafter referred to as: Rex Trans) and TONI COMMERCE 2011 DOO from Bujanovac (hereinafter referred to as: Toni Commerce).

Cement producers and importers were asked to submit data on capacity, production/import and sales on the domestic market, customer structure and deliveries by municipality, as well as price lists and sales policies for all product categories. Cement producers and importers who are also concrete producers (Lafarge, Moravacem and Nexe) were additionally asked to submit data on the production and sale of concrete, price lists and contracts with customers.

Based on the list of companies registered for activity 2363 - Production of fresh concrete, which was submitted by the Chamber of Commerce of Serbia at the request of the Commission, as well as based on customer data submitted by cement producers and importers in the first phase of the

research, another twenty-two (22) concrete producers were identified, that the Commission included in the second phase of the investigation, and in particular: ELITA-COP DOO BEOGRAD, BETON PLUS DOO BEOGRAD, ARMABETON DOO BEOGRAD, GRADIENT DOO BEOGRAD, MARMIL BETON DOO BEOGRAD, ALK BETON DOO BEOGRAD, BETON IN1 DOO BEOGRAD, ESB BETON DOO BEOGRAD, SUNCE BETON DOO BEOGRAD, GP BETONSKA BAZA DOO BEOGRAD, VIKAT DOO STARA PAZOVA, KARIN KOMERC MD DOO VETERNIK, BETONJERKA DOO SENTA, MV PARTNER CONCRETE DOO RUMA, JELA TRADE - BETON DOO VRŠAC, SMB-BETONJERKA DOO SUBOTICA, BETON BB GRADNJA DOO SOMBOR, EURO BETON 008 DOO NOVI PAZAR, NEIMAR DOO KONČAREVO, PRO BETON DOO PADINA, RALEVIĆ DOO PARAĆIN and TRANSKOP BETON DOO PARAĆIN.

Concrete producers were asked to submit data on concrete production and sales, selling price structure, customer structure and delivery by municipality, price lists, rebate policies, contracts with cement suppliers and customers for the period from 2018-2021, as well as their own perception of possible problems that they believe have influenced or may influence the development of competition on the market in question.

The sectoral analysis covers a period of four years, i.e. from 2018 to 2021. Given that the Commission already had certain data on the production, import, export and sale of cement for the period from 2014-2017, for the data that were available, which concern the cement market, the analysis covered an eight-year time period.

3. RELEVANT LEGAL FRAMEWORK

The production and trade of cement and concrete can be seen as part of the broader picture of the construction industry, as an activity that has the greatest importance for the business of the cement industry and concrete production. The construction activity is regulated in detail by the Law on Planning and Construction ("Official Gazette of RS", no. 72/2009, 81/2009 - corrected, 64/2010 - decision of CC, 24/2011, 121/2012, 42/2013 - US decision, 50/2013 - CC decision, 98/2013 - CC decision, 132/2014, 145/2014, 83/2018, 31/2019, 37/2019 - other laws, 9/2020 and 52/2021) and numerous by-laws (the most numerous being decrees and regulations). In conducting this analysis, the Commission addressed issues that may affect product characteristics, market access, and potential regulatory issues that could limit competition in the market.

The Law on Construction Products ("Official Gazette of RS", No. 83/2018) regulates the conditions for market placement and making available on the market of construction products, making a declaration of performance and affixing the conformity mark on construction products, obligations of economic entities, technical regulations for construction products and Serbian technical specifications, simplified procedures, technical assessment bodies, bodies for assessment and verification of constancy of performance of construction products, validity of documents on assessment and verification of constancy of construction performance products and conformity marks issued abroad and other issues of importance for the field of construction products.

Article 3 of this Law stipulates that it applies to all construction products, which are then classified by the areas of construction products, which include cement, construction lime and other hydraulic binders, as well as prefabricated ordinary/lightweight/autoclaved aerated concrete products and products related to concrete, mortar and injection mixture.

Regarding the conditions for placing construction products on the market or making them available on the market, in Article 5, this law sets forth that a construction product is placed on the market or made available on the market if it complies with the technical requirements established by the Serbian technical specification or technical regulation. Article 16 of this Law provides that the importer places on the market of the Republic of Serbia only construction products that comply with the requirements established by this Law.

In accordance with Article 56 of the aforementioned Law, the supervision of the implementation of this Law and the regulations adopted on the basis of this Law is carried out by the ministry responsible for construction affairs.

With regard to cement, the Rulebook on the quality of cement ("Official Gazette of the RS" no. 34/2013 and 44/2014" - hereinafter the Rulebook) prescribes in more detail the quality requirements that must be met by the cement that is placed and/or delivered to the market, as well as the procedures for assessing the conformity of cement, the mark of conformity and marking of conformity, the safeguard clause and the requirements that must be met by the conformity assessment body in order to be appointed to assess the conformity of cement.

According to the Rulebook, cement is divided into types and classes. Types represent categories of cements with regard to composition and production technology, while classes of cement indicate their mechanical characteristics. The provisions of the Rulebook apply to the following two types of cement: general-purpose cement (ordinary Portland cement, sulfate-resistant ordinary cement, white Portland cement, ordinary Portland cement of low heat of hydration) and special-purpose cement (calcium-aluminate cement). Ordinary Portland cement is divided into the following five main types: CEM I Portland cement, CEM II Portland-composite cement, CEM III metallurgical cement, CEM IV pozzolanic cement and CEM V composite cement. Cements are divided into three classes according to their standard strengths: class 32.5, class 42.5 and class 52.5. For each class of standard strength, three initial strength classes are defined: class with ordinary initial strength - N, class with high initial strength - R and class with low initial strength - L¹.

When it comes to concrete, the Rulebook on Technical Norms for Concrete and Reinforced Concrete ("Official Gazette of the SFRY", number 11/87) prescribes the conditions and requirements that must be met during the design, construction and maintenance of structures and elements made of concrete and reinforced concrete. The quality of concrete is determined by the design of the structure, based on the technical conditions for the execution of concrete works, as well as the conditions for such structure and elements during exploitation. The design of the reinforced and non-reinforced concrete structure, depending on the static, operational, technological and other conditions, determines the required brand of concrete (CB) and other concrete properties that determine the durability of the structure. The class of concrete (for a given construction or element) must be indicated in the project documentation, which includes

¹ Class L can only be applied to CEM III cements

either only the brand of concrete (CB) or the brand of concrete (CB) and other properties of concrete prescribed by the Rulebook.

According to the Rulebook, concretes are classified into concretes of the first and second category. Concretes of the first category (BI) can be made without previous tests, with the fact that a certain amount of cement prescribed by the Rulebook must be used. First category concrete can be CB 10, 15, 20 and 25 and can only be installed on the construction site where it is made. Concretes of the second category (B.II) consist of concretes of CB 30 and above, as well as concretes with special properties and transported concretes of all brands. Concretes above CB 60 are special concretes, which can only be used for special purposes. Concretes of the second category are made on the basis of previous tests in accordance with the Rulebook.

In addition to the above, the production of concrete can also be affected by the provision of Article 147 of the Law on Planning and Construction, which stipulates that a temporary building permit is issued for the construction of a concrete factory. Depending on the type of building, i.e. works, a temporary building permit is issued for a precisely determined period during which the building can be used, i.e. works can be carried out, which cannot be longer than three years from the date of issuing the temporary building permit, while the decision on the temporary building permit can be extended once for another three years.

Cement producers are members of the Cement Industry Association of Serbia (CIS). According to the official internet presentation of this association, CIS is a non-governmental and non-profit association for monitoring and analyzing the legal framework that governs the operations of the cement industry in Serbia and the EU, whose activities are aimed at providing professional support to members in: improvement and promotion of good business practice and ethics, socially responsible business and sustainable development, especially ecological construction models; presentation of common positions of the members on the regulatory framework and other topics of importance to the industry; making proposals for adopting or amending regulations in areas of interest to the cement industry; supporting the development of construction projects at the national, regional and local level, as well as other issues of importance for the members' business, at the request of the members.

Based on the analysis of the relevant legal framework related to the cement and concrete production and sales markets in the Republic of Serbia, no legal barriers or other provisions of the regulations were observed that could in themselves distort the state of competition or limit the number of competitors in the relevant markets.

RESEARCH PHASE I - THE CEMENT MARKET

4. STRUCTURE OF THE CEMENT PRODUCTION MARKET

Cement is a hydraulic mineral binder obtained by grinding Portland cement clinker, an artificial stone material created by firing limestone and clay. In addition to Portland cement clinker, a small amount of gypsum is regularly present in the cement, which is added to regulate the setting time of the cement.

Gray (Portland) cement is the basis for obtaining majority of other types of cement. This is the most important type of cement, accounting for about 70% of the world's total cement production. In addition to cements based on Portland cement clinker, there are also special types of cements, which include cements that contain various additives that change the properties of Portland cement depending on the content, and by increasing the content of these additives, the differences between these cements and pure Portland cement are more pronounced.

The total world production of cement is stable and fluctuates around 4 billion tons per year. Cement production is geographically highly concentrated and around 70% of the world's production is carried out in five countries. According to data for 2020, 57.2% of the total world cement production was produced in China alone, followed by India and the USA, which participate in the total world production with 7% and 2%, respectively. The member states of the European Union produce on average about 4% of the world's cement production, and the largest producers are Germany, Italy and France².

According to the data of the Republic Institute of Statistics for the period 2018-2021³, the production of Portland cement in the Republic of Serbia has a growing trend and in 2021 it was 25% higher than the production in 2018.

Table no. 1. - Portland cement production and chain indices (2014-2021)

| Year | Manufacture | |
|------|-------------|-------------|
| | tonnes | chain index |
| 2014 | 1.631.633 | |
| 2015 | 1.654.390 | 101 |
| 2016 | 1.800.805 | 109 |
| 2017 | 1.907.689 | 106 |
| 2018 | 2.092.501 | 110 |
| 2019 | 2.151.404 | 103 |
| 2020 | 2.363.987 | 110 |
| 2021 | 2.610.185 | 110 |

Source: RSO

² The report of the European Cement Industry Association (CEMBUREAU) for 2020 is available on the website: <https://www.cembureau.eu/media/03cgodyp/2021-activity-report.pdf>

³ Production of industrial products from Prodkom's Annual Industry Survey

The trend of cement production growth, which was also recorded in the period included in the analysis from 2018, continued, so that compared to 2014, cement production increased by 60%. In the light of the produced quantities by year, we can conclude that the growth of cement production slowed down only in 2019, when the increase was 3%, so that in the year that preceded it, as well as in the years that followed, production grew at a stable rate of 10% on an annual basis.

In addition to publicly available statistical data on aggregate cement production, during the analysis, data from market participants on cement production were collected and processed. There are three cement producers in the territory of the Republic of Serbia, all three owned by multinational companies. The company Moravacem, a member of the CRH Group (formerly Holcim)⁴ manages a factory in Popovac, located 160 km southeast of Belgrade, the company Lafarge manages a factory in Beočin, located about 95 km north of Belgrade, while the company Titan owns a factory in Kosjerić, located about 135 km southwest of Belgrade. The distance between the cement factories in Popovac and Beočin is approximately 240 km. The cement plant in Kosjerić is about 180 km from the Lafarge cement plant, and about 190 km from the Moravacem cement plant.

The total annual capacity of cement factories in the Republic of Serbia is 3.4 million tons. The installed capacities for the production of cement did not change in the observed four-year period, and the Herfindahl-Hirschman index of industrial concentration remained unchanged at 3.535 points.

Table no. 2 - Production capacities of cement producers in the Republic of Serbia

| Market participant | Annual capacity (t) | Share in capacity (%) | HHI |
|---------------------------|----------------------------|------------------------------|----------------|
| MORAVACEM | 1.350.000 | 39,13 | 1531,19 |
| LAFARGE | 1.350.000 | 39,13 | 1531,19 |
| TITAN | 750.000 | 21,74 | 472,59 |
| Total | 3.450.000 | 100,00 | 3543,97 |

Source: CPC Calculations based on data from market participants

Of the total installed capacity, 78% is owned by the companies Lafarge and Moravacem, while Titan owns 22% of the total installed capacity for cement production in the Republic of Serbia. According to the collected data on the production and consumption of cement, the capacities of cement plants exceed the domestic needs for cement, and the average degree of capacity utilization increased from 60% in 2018 to 75% in 2021.

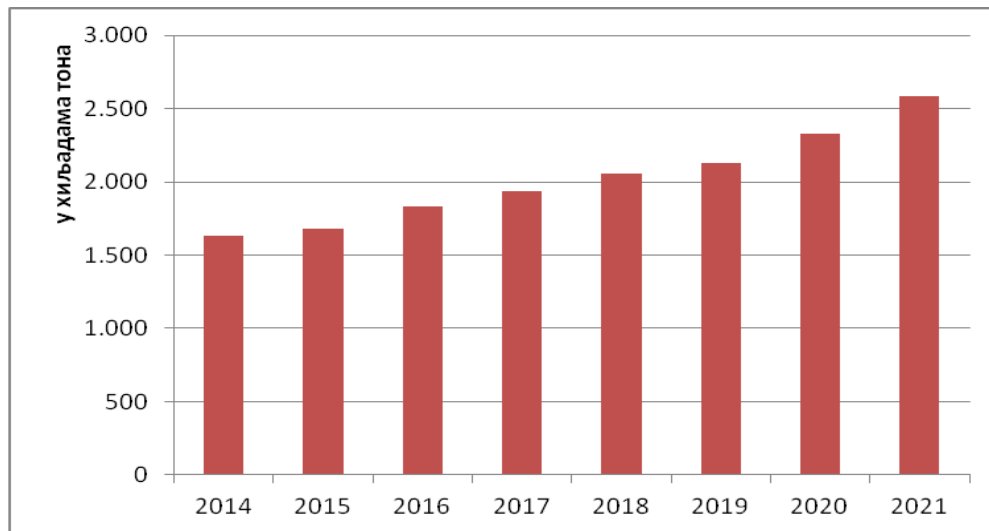
The collected data from cement producers show that the production of gray (Portland) cement in Serbia in the period from 2018 to 2021 recorded growth at an average annual rate of 8%, so that the total production in 2021 was 26% higher than the realized production in 2018.

If cement production is observed over a longer period of time, so that it also includes data from the analysis conducted in 2018, it can be concluded that the stable growth trend in cement

⁴ CRH Group took over operations in Serbia starting on August 1, 2015, and on April 5, 2021, CRH Serbia changed its name to Moravacem.

production from the period 2014-2017 was additionally accelerated, and the realized production in 2021 was 58% higher than in 2014.

Chart no. 1 - Cement production in Serbia (2014-2021) (in thousands of tonnes)



Source: CPC Calculations based on data from market participants

In the eight-year period, cement production increased the most by the company [...], followed by the company [...], and the smallest increase in production was realized by [...]. If, however, the last four years are observed, the production of the company Titan is [...], while Lafarge and Moravacem [...].

The increase in cement production, with unchanged installed capacity, led to an increase in the degree of capacity utilization compared to the period 2014-2017, among all market participants. The highest average level of capacity utilization in the period 2018-2021, is marked by cement factories [...], and the lowest, by cement factory [...].

The largest cement producer in the Republic of Serbia is Lafarge, whose market share in the four-year period increased from /40-50/% to /40-50/%, while the market share of the second largest producer, Moravacem, increased from /20-30/% in the same period. at /30-40/%. On the other hand, the smallest cement producer Titan achieved a decline in market share from /20-30/% in 2018 to /20-30/% in 2021, although [...].

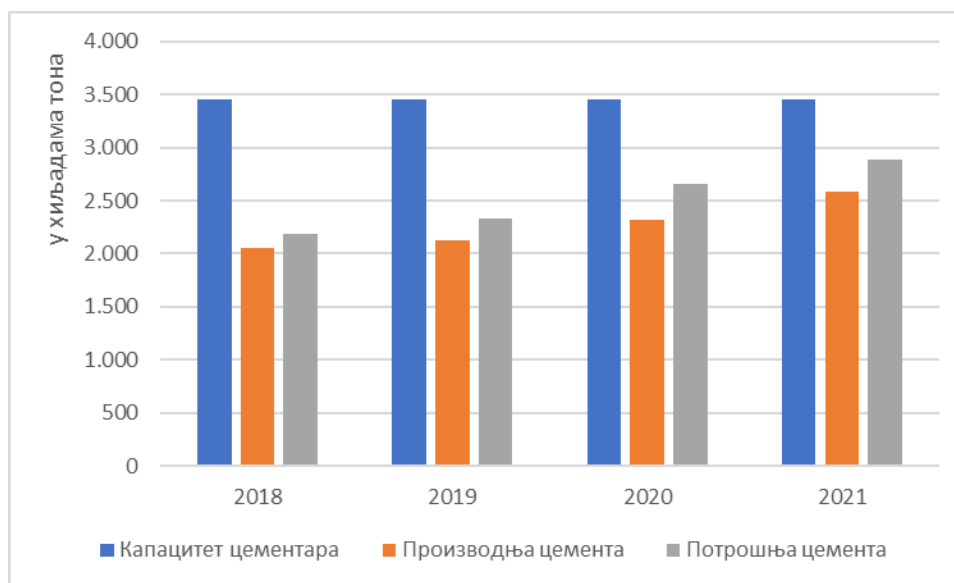
Chart no. 2 - Production structure by manufacturers (2014-2021)

[...]

Source: CPC Calculations based on data from market participants

Considering the stable growth of domestic cement consumption at an average annual rate of about 10%, with the simultaneous growth of production at an average annual rate of 8%, domestic consumption is gradually approaching the available capacity of cement plants, as shown in the following graph.

Chart no. 3 - Capacity of cement plants, production and consumption of cement (2018-2021)
(in thousands of tonnes, blue – cement factory capacity, orange – cement production, grey – cement consumption)



Source: CPC calculations based on data from market participants

Based on all of the above, it can be concluded that the cement production market is a very highly concentrated market, both in terms of the available installed capacity for cement production, and in terms of the achieved volume of production. The market has the characteristics of a classic oligopolistic market structure – a small number of participants with relatively stable market shares that operate profitably, on the supply side, and a large number of buyers, on the demand side, a homogeneous product and high barriers to entry into the industry.

In the light of the said trends in the cement market, if the growth of consumption or production were to continue at the same pace, already in 2023, the capacities of cement plants could be insufficient to meet the domestic demand for cement. This, along with the existing market structure, high barriers to entering the industry and the impossibility of expanding existing capacities in the short term and without major investments, could lead to import dependence and to (further) growth in the price of cement.

5. IMPORTING AND EXPORTING CEMENT

5.1. Importing cement

The total import of cement is dominated by the import of gray cement from Portland cement clinker, which accounted for 91-95% (quantity) and about 90-93% (value) of the total import of cement in the period 2018-2020. In 2021, the import structure changes so that the share of gray cement imports, in terms of quantity and value, was balanced and amounted to about 82%. Due to a significant drop in the average import price of more expensive white cement and a gradual approach to the level of the price of gray cement, the import of white cement increased by 260%

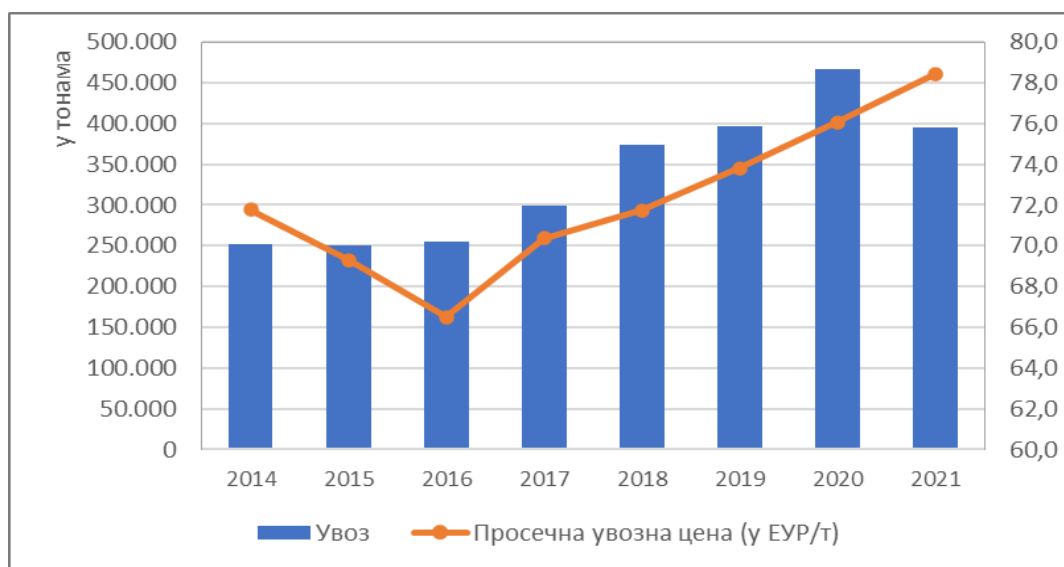
in the observed four-year period, but its share in the total import of cement is still negligible and amounts to about 2-4% (quantitative), that is, 3-5% (by value) of total imports.⁵

The total import of gray cement had a growing trend in the period from 2016 to 2020, when it exceeded 450 thousand tons. In 2021, there was a 15% drop in imports compared to the year before, and cement imports returned to the level of 2019. As a result of the aforementioned trends, compared to 2014, the increase in imports amounted to 57%, while compared to 2018, imports increased by only 6%.

Chart number 4 shows the movement of imported quantities and unit value of imports for the period from 2014 to 2021. The left y-axis shows the import of gray cement in tons, while the right y-axis shows the average import price of cement in EUR/t.

Based on the attached graph, it can be concluded that in the period from 2014 to 2016, the stagnation of imports was followed by a drop in the average import price of gray cement by 8%. The growth of gray cement imports in the period that ensued, followed the recovery, and then the further growth of the average import price, which in 2021 reached 78 euros/t.

Chart no. 4 - Gray cement imports and average import price (2014-2021)
(in tonnes, blue – import, orange – average import price in EUR/t)



Source: CPC Calculations based on data of the Customs Administration

Cement is mainly imported from Croatia⁶ and Albania⁷, while imports from other countries are marginal and do not exceed 1% in total. Cement from Croatia is in the period from 2018-2021

⁵ According to the customs classification, the import of cement is covered by the following tariff codes:

- 2523 10 00 00 - Cement clinkers;
- 2523 21 00 00 - Portland cement - White cement, whether or not artificially coloured
- 2523 29 00 00 - Portland cement - Other (gray);
- 2523 30 00 00 - Aluminous cement;
- 2523 90 00 00 - Other hydraulic cements

⁶ Nexe - Našicecement factory- Našice, Cemex - Solin

⁷ Factory owned by Greek "Titan", Fushe Kruje - Tirana

was more expensive than cement from Albania by 20-30%, while it was more expensive than the average import price by 4-7%.

Table no. 3 - Gray cement import market structure (four-year average)

| Name of the importer | market share % |
|----------------------|----------------|
| NEXE BETON | /50-60/% |
| TONI COMMERCE | /20-30/% |
| INTERNORMA | /5-10/% |
| REX TRANS | /5-10/% |
| CEMEX SRB | /5-10/% |
| Others total | /0-5/% |

Source: CPC Calculations based on data of the Customs Administration

The gray cement import market is a highly concentrated market, where the first two participants make up about $\frac{3}{4}$ of the total imports. The import of cement is geographically highly concentrated, because almost the entire amount of imported cement is imported from two neighboring countries, with only Croatia importing about $\frac{3}{4}$ of the total amount of imported cement. Considering the above, it can be said that the average import price of cement is determined by the price movement of the more expensive Croatian cement.

5.2. Exporting cement

The total export of cement is dominated by the export of gray cement from Portland cement clinker, which in the period 2018-2021 accounted for 80-95% of exported cement quantities and 88-96% of export value.

Total export of gray cement in the period 2019-2021, had a rapidly decreasing trend, so that in 2021 the export was 63% lower than the achieved export in 2018. The downward trend in cement exports followed several years of growth achieved in the period from 2014-2018. A significant increase in exports was achieved in 2017 and 2018, when exports were 123% higher than in 2014.

Chart number 5 shows the movement of exported quantities and unit value of exports for the period from 2014 to 2021. The left y-axis shows the export of gray cement in tons, while the right y-axis shows the average export price of cement in EUR/t.

Chart no. 5 - Gray Cement Exports and Average Export Price (2014-2021)
(in tonnes, blue – export, orange – average export price in EUR/t)



Source: CPC Calculations based on data of the Customs Administration

Based on the attached graph, it can be concluded that in the period from 2014 to 2017, the average export price of gray cement decreased by 4%. The drop in gray cement exports in the period 2018-2021, was followed by recovery and then further growth of the average export price, which in 2021 reached 74 euros/t.

Cement is mainly exported to Montenegro and between 82% and 93% of the total exported quantities and between 80% and 93% of the value of the total exported cement are placed on this market.

Table no. 4 - Export structure by country of destination (four-year average)

| Country of destination | Share in import (%) |
|--------------------------|---------------------|
| Montenegro | 89.2% |
| Croatia | 8.1% |
| Bosnia and Herzegovina | 2.4% |
| Other countries in total | 0.3% |

Source: CPC Calculations based on data of the Customs Administration

The largest exporter of gray cement is the company Titan, whose share in the total export is between /90-100/% and /90-100/%, while the total amount exported is [...]. This company mainly exports to [...] and to [...], and negligible quantities are also marketed to [...]. The second exporter is the company Moravacem, whose share in the total exported amount of cement decreased from /5-10/% in 2018 and 2019 to /0-5/% in 2020 and 2021, while the total exported

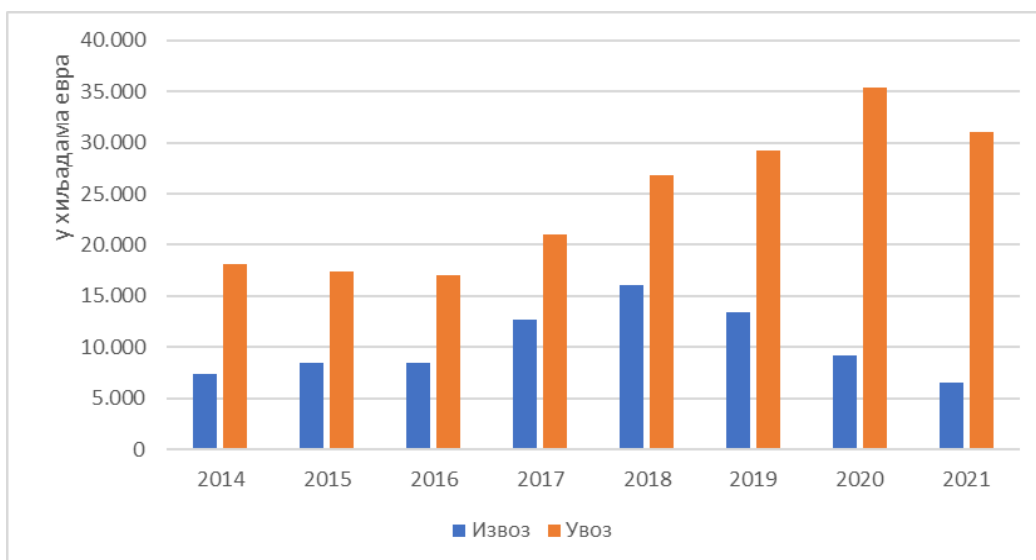
amount of the said companies amounted to [...] in a period of four years. This company exports cement to [...] and to [...]. Shares of other exporters are negligible and together do not exceed 2% of total exports.

5.3. Coverage of imports by exports

The relative ratio of imports and exports can be expressed by the coverage of imports by exports, an indicator that measures the ability of the country as a whole, that is, of certain economic sectors/commodity groups, to maintain balance in commodity exchange. Chart number 6 shows the comparative movement of the value of the realized import and export of gray cement in the period 2014-2021, on the basis of which the coefficient of coverage of import by export can be calculated for each observed year using the following formula:

$$\text{Coverage ratio} = \text{realized export}/\text{realized import}$$

Chart no.6 - Coverage of imports by exports (2014-2021)
(in thousands of tonnes, blue – export, orange – import)



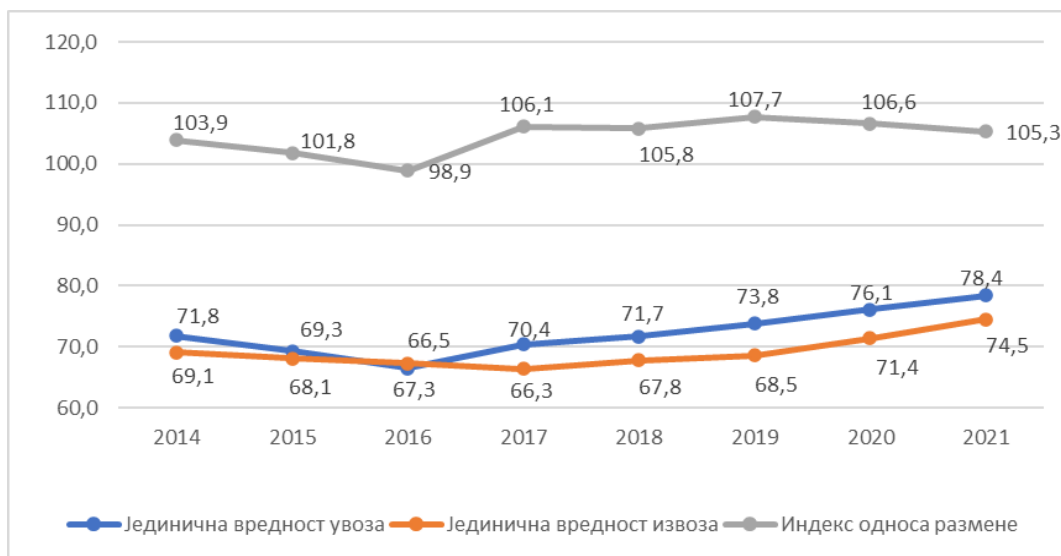
Source: CPC Calculations based on data of the Customs Administration

The coverage of imports by exports followed the growth of exports, and reached its maximum in 2017 and 2018, when it was around 60%. In the period that followed, a significant drop in exports was recorded along with a changing trend in imports, which led to a gradual decrease in the coverage of imports by exports, and this rate in 2021 was 21%.

Chart number 7 shows the comparative movement of the unit value of cement imports and exports, as well as the exchange ratio index, which represents the relative ratio of export and import prices.

Chart no. 7 - Comparative overview of the average import and export price in EUR/t (2014-2021)

(blue – unit value of import, orange – unit value of export, grey – exchange ratio index)



Source: CPC Calculations based on data of the Customs Administration

Based on the movement of the unit value of imports and exports, several conclusions can be drawn.

In the first part of the eight-year period, both the average import and export prices had a negative trend, which ended in 2016, when the average import price was at its minimum, i.e. a year later when it comes to the average export price. In the period that followed, both series showed an increasing trend, and the average import price increased by 18% compared to 2016, while the average export price increased by 12% compared to 2017, when it achieved the lowest value for the observed period. Considering the aforementioned trends, in 2021, compared to the beginning of the period, an almost identical growth in the unit values of imports and exports was achieved, so that the average import price increased by 9%, while the average export price increased by 8%.

The drop in the average export price in the first part of the observed period followed the growth of exports, while the drop in the average import price followed a slight drop in imports. In the second part of the observed period, the growth of the average import price followed the growth of imports, while the growth of the average export price followed the decline of exports.

The average import price was higher than the average export price throughout the period, except in 2016, when it was slightly lower. The observed series of average prices gradually converged in the first part of the period, with a decrease in the exchange rate index, and the values achieved were closest in 2016, when the average import price was at its minimum. In the period that

followed, the observed series moved almost in parallel, so the exchange rate index is stable until the end of the period.

Based on the aforementioned trends in foreign trade, and bearing in mind the trends in the production and consumption of cement on the domestic market, the marginalization of exports, as well as limitations from the point of view of installed production capacities, it can be concluded that in the coming period, the Republic of Serbia could be dependent on imported cement origin. Depending on the trends in the world and regional markets, this trend could lead to a further increase in the average import price, and therefore to an increase in the selling prices of cement on the domestic market.

6. STRUCTURE OF THE CEMENT SALES MARKET

The aggregate supply of cement on the domestic market consists of domestically produced cement and imported cement. Cement of imported origin from neighboring countries exerts competitive pressure on domestic cement producers, owing to the relatively short distance of the factories from the border of the Republic of Serbia, which makes cement transportation economically profitable.

The total sales of domestically produced cement on the Serbian market followed the production trend and in 2021 was 33% higher than the sales achieved in 2018. Domestic cement producers sell on average about 95% of the total produced quantities to the Serbian market, while the remaining 5% is exported, with a tendency to completely redirect to the domestic market.

Chart no. 8 - Sales of domestically produced and imported cement on the Serbian market (in thousands of tonnes)



Source: CEA Calculations based on data from market participants

Assuming that the entire imported amount of cement is placed on the domestic market in the year of import, the share of imported cement in the total offer did not change significantly in the period 2018-2020, it was around 17%, while in 2021 it was 14%.

If the trend of total sales of cement is observed over an eight-year period, it can be concluded that sales from domestic sources increased by 67%, while sales of imported cement in the same period achieved a growth of 57%.

Chart no. 9 shows the structure of the cement sales market and the market concentration index for the period from 2018 to 2021. The left y-axis shows the market shares of cement producers and importers, while the right y-axis shows the Herfindahl-Hirschman index of market concentration.

Chart no. 9 - Structure of the cement sales market and degree of market concentration

[...]

Source: CPC calculations based on data from market participants

The cement industry is a consolidated industry, characterized by an oligopolistic market structure with a high degree of concentration, which is also confirmed by the Herfindahl-Hirschman index of industrial concentration, which exceeded 2800 in 2021. There are four participants in the cement sales market, three producers and one importer, who together account for 92-94% of the total sales of cement in the observed four-year period.

The geographical location of cement factories in the territory of the Republic of Serbia is an obstacle to more intense competition between producers, because cement is a product whose distribution is economically justified within a radius of about 300-350 kilometers. Competition between cement producers is most pronounced in the Belgrade region, where all three producers are present, while each of the producers is more significantly represented in their respective local area, where they are simultaneously exposed to competition from cement importers from neighboring countries.

The market shares of producers on the sales market are relatively stable, they are somewhat lower but do not deviate significantly from their shares on the production market. The exception is the company Titan, which in the first three years of the observed four-year period placed a significant part of the total sold quantities on the foreign market, as a result of which the share of that company in the sales market is visibly smaller than the share in the production market. [...]

Manufacturers and importers sell cement to final consumers and wholesalers. Concrete mixers, construction companies, manufacturers of concrete elements and other products are included in the category of final consumers, while other customers who buy cement for resale are treated as distributors, that is, wholesalers.

In relation to the total sold quantities on the domestic market, sales within the group are slightly increasing, but still relatively small and ranging from 5% to 12%. The above shows that cement producers make the majority of their income from the sale of cement by selling it to third parties.

Cement is sold on the market of the Republic of Serbia in two forms - as bulk and as packaged (jacketed). Bulk cement makes up about 2/3 of the total cement sold, with a gradual increase in the share from year to year. Packaged cement is generally delivered in bags of 25 kg and 50 kg at ex-works delivery terms (the customer independently arranges transportation), while bulk

cement is sold at ex-works delivery terms (named place of delivery). Cement producers and two importers are predominantly oriented towards the sale of bulk cement (70% and more), with one importer, bulk and packaged cement are equally represented, while one importer sells exclusively packaged cement.

7. CEMENT SELLING PRICES

Bearing in mind that almost the entire production of cement is used for the production of concrete, which is used as a raw material in all types of construction works, it can be said that the movement of the price of cement in the past period was conditioned by both rising production costs and fluctuations on the demand side, which are primarily a reflection of trends in the construction industry.

One of the key challenges faced by cement producers on a global scale in the past few years is the rising cost of production. The record rise in energy prices in the second half of 2021 put pressure on the operating margins of cement plants and forced producers to increase the producer price of cement. For example, one of the world's largest producers, Cemex, reported a significant year-on-year increase in the price of cement on the European market of 8% in 2021, with the price of cement increasing by 10%⁸ in the last quarter of 2021 alone. The price of cement on the American market increased by 7.4% in the period from 2018 to 2021⁹, while on the market of the second largest world producer, India, the price of cement increased by 6%¹⁰ in the same period.

Further on, the trend of the average selling price of cement on the market of the Republic of Serbia, calculated as the ratio of total sales by value and by quantity, is presented, and then the official price lists of market participants - manufacturers and importers of cement - are analyzed.

7.1. Average selling prices of cement and their structure

The average selling prices of gray cement had an increasing trend in the observed four-year period for all producers and importers, so that in 2021 they were 8-13% more than in 2018.

If the comparative movement of the average selling price of the three producers and the two largest importers is presented graphically, one producer and one importer can be singled out, which had lower average prices¹¹ in the entire period, while the average prices of the remaining three market participants were not significant in most part of the observed period.

Chart no. 10 - Movement of the average selling price of gray cement in RSD/t (2018-2021)

[...]

Source: CPC Calculations based on data from market participants

⁸ Cemex, Fourth Quarter Results 2021, downloaded from: <https://www.cemex.com/documents/20143/52736797/CXING21-4.pdf/8b809384-ea2d-4ff8-a435-913445f866eb?t=1644504364426>

⁹ <https://www.statista.com/statistics/219339/us-prices-of-cement/>

¹⁰ <https://www.statista.com/statistics/690012/wholesale-price-index-of-cement-and-lime-india/>

¹¹ [...].

In the next phase of the analysis, the comparative movement of the total volume of cement production and the average selling price was observed, calculated as the ratio of the total realized sales value and the total sales volume in the respective years.

Chart no. 11 - Trends in production volumes and average selling prices (2014-2021)
(in thousands of tonnes, blue – production, red – average selling price in RSD/t)



Source: CPC Calculations based on data from market participants and Customs administration

The left y-axis shows the production of gray cement in thousands of tons, while the right y-axis shows the average selling price of cement in RSD/t. The growth of production, ending in 2018, was accompanied by a drop in the average selling price, while in the period that followed, the average selling price also grew with the growth of production. At the end of the observed eight-year period, the total production of cement was 58% higher than in 2014, while the average selling price slightly exceeded the level of 2014.

Market participants, producers and importers of cement, were additionally asked to present the structure of the selling price of cement. Although the submitted answers differ significantly, in principle it could be concluded that the origin of cement significantly determines the structure of the selling price, and that in the structure of the producer price, the most important item is fuel and energy costs.

The producer price structure of bulk cement is dominated by variable costs, which make up about 70% of the producer price. Among the variable costs, the costs of fuel and energy, which account for about 50% of the production price, and the costs of raw materials, which make up about 10%, stand out. Of the fixed costs, depreciation stands out, which accounts for 8-16% of the producer price of cement. In the structure of the producer price of packaged cement, variable costs without packaging account for 50-60%, while packaging costs make up 10-15%.

According to the data obtained from the importer, the purchase price of the sold cement dominates the selling price structure of cement, which makes up 75-80% of the selling price. The

cost of transportation and forwarding is on average 18-20%, while the importer's margin is 2.5-3%.

Based on the above, it can be concluded that the growth of gray cement production in the period from 2018 to 2021 was accompanied by the growth of the average selling price, and in 2021 the average selling price of cement returned to the level of 2014. The said trend is not expected, but it can be partly explained by the sudden increase in fuel and energy costs, which account for about 50% of the production price of cement, and which, according to official statistics, have increased by about 20% ¹²in 2021 alone. On the other hand, during the entire eight-year period, the average selling price was above the average export price, which, along with growing domestic demand, could explain the gradual reorientation of producers to the domestic market and the marginalization of exports. Among the cement producers, [...] had the lowest average selling price, which could be explained by [...], as well as by the fact that [...], which will be explained in more detail in the continuation of the analysis.

7.2. Analysis of prices according to official price lists of market participants

In addition to the analysis of average selling prices on an annual basis in the previously described manner, official price lists and other decisions on price changes submitted by market participants were also analyzed, and refer to the period 2018-2021.

Based on the review of the submitted documentation, it was established that two cement producers have a single basic price list of cement producer prices at ex-works parity for the entire market of the Republic of Serbia, while one of the producer's price list of finished products contains separate prices for each place of delivery (municipality or city), including the factory pickup price. Cement manufacturers, by special decisions, regulate certain types of rebates, such as quantitative (according to consumption channels), regional, project, promotional, seasonal, advance payments, etc.

Cement importers set prices at the parity of DDP buyer (delivered duty paid) and DAP (delivered at place), while some importers offer the possibility of collection at the specified location (seller's/importer's warehouse) at the parity of FCA (free carrier).

Cement manufacturers market two basic types of gray cement - PC 35M (VL) 42.5N / CEM II/BM (VL) 42.5N¹³ and PC 20M(SL) 42.5R / CEM II/AM(SL) 42.5R¹⁴, both in bulk packaging and in 50 kg and 25 kg bags. By examining the submitted price lists of manufacturers, it was established that the prices of cement in the observed four-year period achieved a noticeable

¹² Monthly price indexes of manufacturers of industrial products for the domestic market by consumption purpose groups (energy), taken from: <https://data.stat.gov.rs/Home/Result/030201010602?languageCode=sr-Latn>

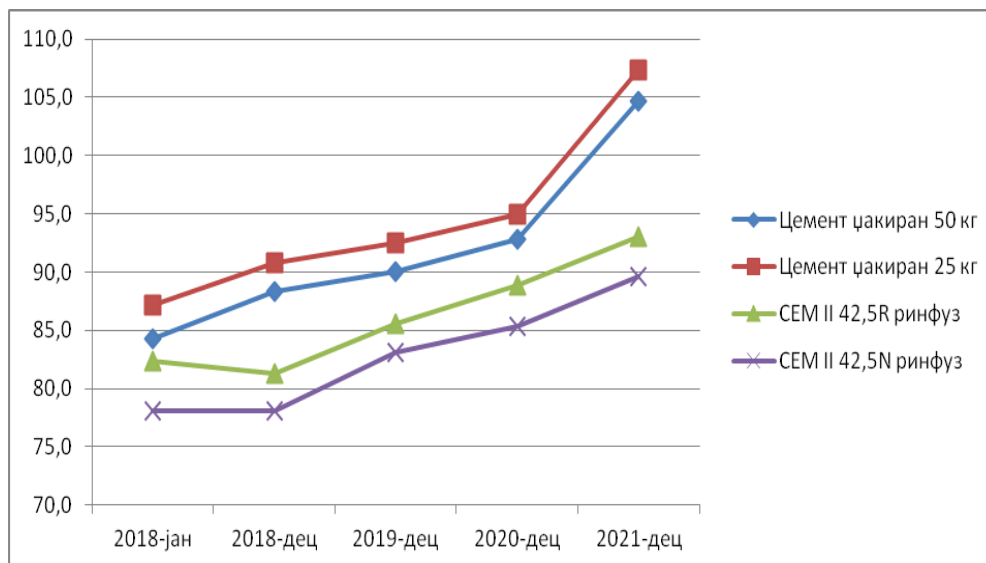
¹³ PC 35M (VL) 42.5N / CEM II/BM (VL) 42.5N is a Portland-composite cement, with a proportion of 65-79% clinker and 21-35% mixed addition of silicate fly ash and limestone. This is a widely used cement, suitable for the production of transported and pumped concrete, as well as for the production of all types of reinforced concrete constructions;

¹⁴ PC 20M(SL) 42.5R / CEM II/AM(SL) 42.5R is a Portland-composite cement, with a proportion of 80-88% clinker and 12-20% mixed addition of slag and limestone. This is cement of stable quality, intended for the production of all types of concrete.

increase. The producer price of the most widely used jacketed cement increased by an average of 23-24%, while the price of bulk cement increased by an average of 13-15% in the same period.

Chart no. 12 - Average producer price of cement in EUR/t (2018-2021)

(blue – jacketed cement 50kg, red – jacketed cement 25kg, green – CEM II 42.5R bulk, purple – CEM II 42.5N bulk)



Source: CPC Calculations based on data from market participants

In contrast to bulk cement, the average price of which in the four-year period grew steadily by an average of 3-5% on an annual basis, the average price of packaged cement increased by 13% in 2021, after a more modest growth in the first years of the observed period, compared to 2020.

The largest increase in the price of packaged cement was achieved by [...], while the lowest increase was recorded in [...]. When it comes to bulk cement, the price was increased the most by [...], while the lowest increase was achieved by the company [...].

Based on an insight into the movement of the prices of the most widely used bulk cement (42.5N), on December 31, it can be concluded that the highest price according to the price list in the four-year period was [...], although during 2018 the prices of this producer deviated slightly from prices [...]. The lowest price in the first years of the observed period was [...], and in the last two years the price of this producer approached the price of [...].

Chart no. 13 - Movement of average producer prices of bulk cement (in EUR/t)

[...]

Source: CPC Calculations based on data from market participants

When it comes to packaged cement in 25 kg bags, the prices of all three producers were at approximately the same level in the first year of the observed period, only to notice certain deviations from 2019, which especially applies to 2021.

Chart no. 14 - Movement of average producer prices of packaged cement (in EUR/t)

[...]

Source: CPC Calculations based on data from market participants

Based on an insight into the price lists of cement producers, it could be concluded that the prices of jacketed cement were changed on average two to three times a year, while the prices of bulk cement were changed at most once a year. In contrast to bulk cement prices, which differed between producers both in the level and in the date of changes, a certain parallelism in behavior could be observed for packaged cement. In the observed period, [...] and [...] followed each other primarily and their prices of bagged cement in 25 kg and 50 kg bags differed by an average of one euro.

Table no. 5 - Price changes of packed cement in 25 kg and 50 kg bags (in EUR/t)

[...]

Source: Data on market participants

According to the explanations from the submitted price lists, the increases in cement prices in the observed four-year period were mainly a response to the increase in production costs due to increased inflationary pressures, among which energy and transport costs and investments aimed at harmonizing with European Union regulations, such as reducing harmful gas emissions, stand out, as well as a higher degree of substitution of fossil fuels with alternative ones.

Taking all of the above into account, it can be concluded that the growth of the average selling price of cement expressed as the quotient of the total sales value and the total sold quantity was accompanied by the growth in the price of cement on the world market¹⁵, as well as the growth in the prices of imported cement, while the percentage of price increases according to the data from official price lists significantly differs from the average increase in the price of cement on an annual level for all observed market participants. One of the reasons for the said deviation could be the numerous types of rebates and other discounts that cement manufacturers approve on the manufacturer's price from the price list, and the average net selling price obtained as a ratio of sales value to sold quantity, can be lower than the price from the price list. Also, cement producers who are also concrete producers deliver cement to their own concrete plants at lower, transfer prices, which further reduces the average selling price of cement compared to the manufacturer's price from the price list. The sales policy of cement producers and importers will be covered in more detail in chapter 10, while concrete production and the vertical connection of the concrete market with the cement market will be covered in chapters no. 11-14.

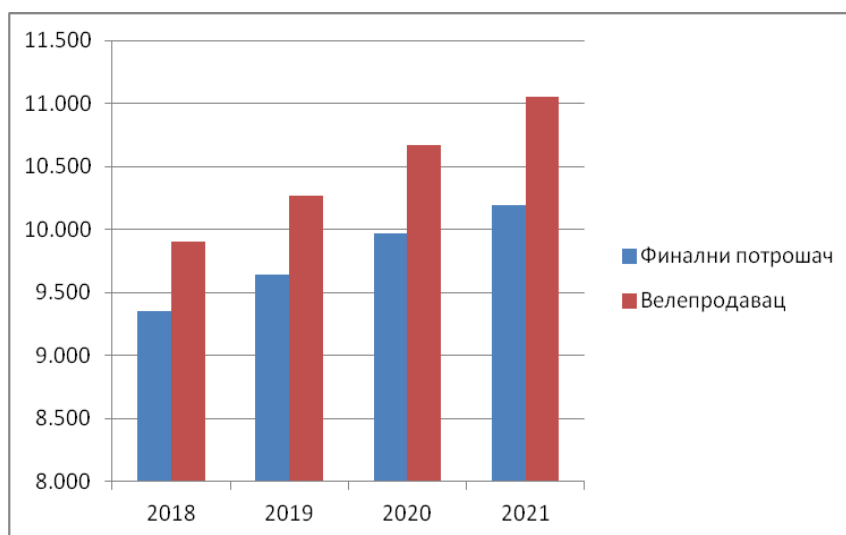
8. STRUCTURE OF CEMENT BUYERS

¹⁵ See page.19

The structure of cement buyers and the commitment to a certain distribution channel is primarily determined by the origin of the cement. On average, cement producers deliver about 65% of the sold quantities directly to final consumers, while about 35% are sold through distributors. One producer is predominantly oriented towards sales to final consumers (over 85%), while the remaining two market between 50% and 60% of total sales through this channel. Among cement importers, there is a noticeable tendency to predominantly focus on one sales channel. Two importers sell cement mainly to final consumers (over 60%), and the remaining three importers market cement (almost) exclusively through a network of wholesalers.

All three cement producers have an extensive network of customers, with the share of the top five customers in total sales generally ranging between 30% and 45%. With cement importers, on the other hand, the number of buyers generally does not exceed 50, and the concentration of sales on a small number of buyers is more pronounced. The share of the first five buyers in the total volume of sales for cement importers is over 60%, and for some importers over 90%. This structure of buyers is determined by the prevailing sales channel, which when it comes to importers is mainly limited to cement distributors.

Chart no. 15 - Average producer price of cement per channel of sale (in RSD/t)
(blue – end consumer, red – wholesaler)



Source: CPC Calculations based on data from market participants

The average producer price of cement for the category of wholesalers was in the observed four-year period by 5-10% higher than the producer price for the category of final consumers, with a gradual increase in the price difference between the two categories of customers. This difference could be explained by a significantly higher total volume of delivery to the category of final consumers (who mainly buy bulk cement) compared to the category of wholesalers (who buy mainly jacketed cement), although between the producers and importers themselves, these two categories of customers share in the total cement deliveries can vary significantly.

9. DELIVERIES BY MUNICIPALITIES

9.1. Delivered quantities and average selling prices by municipality

The total number of cement deliveries to the observed market participants grew over a four-year period and in 2021 was 34% higher than in 2018. The average amount of cement per delivery for producers and importers does not differ significantly and amounts to about 25 tons.

Moravacem with a factory in Popovac supplies cement mainly in the region [...] in a radius of up to [...] km, with the average delivery radius being [...] km. In the total amount delivered by the Moravacem company, [...], [...], [...] and [...] stand out. Together, these four municipalities make up about 35-45% of the total cement deliveries of that company.

The company Lafarge with its factory in Beočin supplies cement mainly in the territory [...], within a radius of up to 350 km. [...], [...] and [...] are the leaders in the total delivered quantities, which together make up about 50% of the total delivered cement quantities.

Titan, with its factory in Kosjerić, delivers cement within a radius of up to 375 km. Of the total volume delivered by Titan, about 30% is delivered in the territory of [...], about 10% in [...] and about 15% in [...] and [...] together, which together make up about 50-55% of total cement deliveries of that society.

Based on the review of buyers by municipality¹⁶, it can be concluded that a certain (although not precise) division of the market in the geographical sense exists and that it is determined by the location of the factory. [...]

The following graph shows a comparative geographical view of the delivery locations for three cement producers, where the presence or absence of producers in certain narrower geographical areas can be observed. The maps include delivery locations that together account for more than 95% of the total delivered quantities of cement from each manufacturer.

Chart no. 16 - Geographical display of cement delivery locations

[...]

Source: Data on market participants

Cement importers deliver mainly in geographical areas close to the importer's headquarters, i.e. the country from which it is imported.

“Nexe beton”, based in Novi Sad, mainly supplies cement in the territory [...]. Of the total delivered quantities, most are delivered to [...], [...] and [...], between 75-80% collectively, and significant quantities are delivered to both [...] and [...].

Out of the total amount of cement delivered, Cemex, based in Niš, delivers the most in the regions [...], in the following municipalities: [...], [...], [...] and [...]. These four cities collectively participate in the total delivered quantities with 75-85%¹⁷.

¹⁶ The provided data on deliveries by municipality refers to the municipality where the customer's seat is located, which may not always correspond to the actual place of delivery, and which especially refers to deliveries for the needs of certain infrastructure projects.

¹⁷ [...].

Rex Trans, based in Arilje, is an importer and wholesaler of cement of the Cemex group and mainly supplies the regions of central, southwestern and western Serbia. The largest quantities are delivered in the territories of the municipalities of Arilje, Arandelovac, Ivanjica and Petrovac na Mlava, and these municipalities together account for 45-50% of the company's total cement deliveries.

Toni Commerce based in Bujanovac is an importer of cement from Albania and mainly delivers in the region of southern and southwestern Serbia. In the territories of the municipalities of Bujanovac and Prijepolje, over 95% of the total amount of cement delivered by this importer in the observed four-year period is marketed.

Internorma, based in Novi Pazar, is an importer and wholesaler of cement from Albania and mainly supplies the region of southwestern Serbia. The largest quantities are delivered in the territories of the municipalities of Novi Pazar, Tutin and Raška, and these three municipalities together account for 80-85% of the company's total cement deliveries.

Acknowledging the fact that importers do not have an ex-works price, and that their selling prices are shown with all associated transport costs to the place of delivery, in the next step a comparison of average selling prices for deliveries in selected (larger) cities or municipalities was made. Average selling prices for each city/municipality were obtained by dividing the total value of delivery in that city/municipality by the total delivered quantity. The lowest average selling price in each city/municipality in a given year is marked in green. Empty fields indicate that the market participant in the given year did not indicate delivery in that municipality/city.

Table no. 6 - Average selling prices for delivery in selected municipalities (2021)

| Market participant | Belgrade | Novi Sad | Zrenjanin | Kragujevac | Kruševac | Čačak | Čajetina | Niš |
|---------------------------|-----------------|-----------------|------------------|-------------------|-----------------|---------------|-----------------|---------------|
| Lafarge | [...] | [...] | [...] | [...] | [...] | [...] | [...] | [...] |
| Moravacem | [...] | [...] | [...] | [...] | [...] | [...] | [...] | [...] |
| Titan | [...] | [...] | [...] | [...] | [...] | [...] | [...] | [...] |
| Nexe | [...] | [...] | [...] | [...] | [...] | [...] | [...] | [...] |
| Cemex | [...] | [...] | [...] | [...] | [...] | [...] | [...] | [...] |
| Average price | 9.525 | 11.170 | 9.741 | 10.463 | 10.764 | 10.030 | 10.658 | 10.875 |

Source: CPC Calculations based on data from market participants

Based on the data from the table, it can be concluded that the average price at parity ex-works in the Belgrade region is lower than the average selling price at the same parity in other municipalities, that is, cities. This can be explained by the fact that in the Belgrade region competition is more intense than in other regions, among other things due to the fact that the distance of factories from Belgrade does not differ significantly and ranges from 95 to 167 km, and all manufacturers and one importer deliver in the Belgrade region.

9.2. Correlation analysis

In order to determine the degree of connection between the place of delivery and the selling price, in the next step, a correlation analysis was performed of the average selling prices for each place of delivery and the distance of the place of delivery from the factory. The average selling price for each place of delivery was obtained on the basis of the provided data of the manufacturer on the delivered quantities and the value of delivery by individual municipalities in Serbia. Then, for each manufacturer, the distance of individual delivery points from the factory was calculated according to the fastest route shown on the website www.google.rs/maps. Given the large number of municipalities where negligible quantities of cement are delivered, the municipalities were first sorted according to the delivered quantities, from the municipality with the largest delivered quantity to the municipality with the smallest delivered quantity, and the analysis included municipalities whose collective share in the total delivered cement amounts to about 95%.

The correlation coefficient is a measure of the strength (degree) and direction of the association between two variables. The values of the correlation coefficient range from (+1), which indicates a perfect positive correlation, to (-1), which indicates a perfect negative correlation. Values close to zero indicate a very weak correlation or, in the case of zero correlation, its complete absence.

The following table shows the obtained value of the correlation coefficient for each manufacturer. The data refer to year 2021.

Table no. 7 - Correlation analysis 1 (selling price - distance of delivery point)

[...]

Source: CPC Calculations based on data from market participants

Based on the data in the table, we can conclude that the correlation is weak, which in this particular case could be interpreted as meaning that there is no significant correlation between the distance from the factory and the ex-works selling price.

Moreover, for the two producers, the correlation coefficients are negative, which means that cement is delivered at a lower price at a longer distance, which is also unexpected. Given the above, in order to determine whether there is a connection between the quantity delivered in a certain municipality and the average selling price, correlation coefficients were additionally calculated between the delivered quantities and average selling prices per municipality.

Table no. 8 - Correlation analysis 2 (selling price - delivered quantity)

[...]

Source: CPC Calculations based on data from market participants

The individual correlation coefficients are negative, which means that the relationship between the observed variables, in the specific example of delivered quantities per municipality and the average selling price, is inverse, that is, a higher delivered quantity corresponds to a lower average selling price and vice versa. The correlation coefficient is significant only for one market participant, while for the remaining two it indicates a relatively weak connection between the observed variables.

Based on the conducted price analysis, it appears that the geographical distance of the place of delivery from the factory is not the predominant factor in the formation of the sale price of cement, but it is also influenced by the intensity of competition in a certain geographical area. On the other hand, although the correlation between the sales price and the delivered quantity is weak for two out of three market participants, it can be assumed that one of the criteria when forming the sales price for customers from a certain geographical area, i.e. the amount of rebate granted to those customers, represents the total delivered quantity in a given municipality, i.e. the place of delivery.

10. ANALYSIS OF SALES POLICIES OF CEMENT MANUFACTURERS

Cement sales policies represent instructions and guidelines for the formation of cement prices and serve to more closely define the sales activities of companies.

For the purposes of sectoral analysis, defined sales policies were submitted by two market participants, while for other market participants, the commercial policy is determined by the official price list and/or separate decisions. Of the market participants who submitted defined sales policies, in one case it is a document of a general type, in which only the types of rebates that can be approved are specified, but not the rebate scales, while in the other case, the sales policy is a detailed document containing market definition, price list for the Serbian market and discount scales for regional markets, especially for bulk, and especially for jacketed cement.

By reviewing the data containing the sales policies, price lists and accompanying decisions of the market participants included in the analysis, it could be concluded that the invoiced price (of the manufacturer) most often contains the following elements: basic price (ex-works price according to the official price list), fees, discounts and transport.

Discounts are granted on several grounds and can generally be grouped into:

- quantity rebates (depending on the realized annual delivery of cement);
- discounts based on customer segmentation (discounts based on the marketing and sales strategy of the company, and most often by sales channels - distributor, construction, concrete mixers, powder materials, etc., as well as according to whether they buy jacketed cement or bulk cement).
- regional discounts (discounts for individual municipalities or regions, which are approved based on specific market conditions in a certain region),
- discounts for cement that is sold for further production and export of construction materials (in order to develop the domestic construction industry and encourage the export of cement-based construction materials),
- project discounts (discount for customers working on a project, which from the company's perspective have a certain importance),
- promotional discounts (discount approved for promotional purposes, limited in time and space),
- discounts for one-time advance payments, etc.

Volume rebates can be annual, quarterly and monthly. The selling prices of cement can be defined so that, based on the required quantity of cement, the relevant rebate is included and shown as a net price, or the customer is offered the opportunity to obtain a rebate based on his realization, which is approved retroactively, according to realized quantities. They can be paid in the appropriate amount of cement that corresponds to the calculated rebate, and at the customer's request, the amount of the calculated rebate can be refunded. Volume rebates are most often expressed through rebate scales in the form of a percentage or in a nominal amount (EUR/t), and they can be introduced once and/or canceled by separate decisions of the company. This discount category may contain a single discount scale for the entire Serbian market or separate discount scales by delivery region.

Project rebates can further be classified according to the type of project into agricultural, energy, infrastructure, industrial facilities and projects by size, within which special rebate scales are shown according to the scale of cement consumption.

Regional discounts imply the grouping of customers on a territorial basis (municipality, district or region) and are directly or indirectly applied by most market participants. Two market participants segment customers on a territorial basis through different percentages of rebates or rebate scales depending on the delivered quantity (in which case the amount of the rebate percentage is determined according to the buyer's potential), while the other market participants do it by setting prices for delivery on a specific territory, based on the official price list or accompanying decisions.

Based on an insight into the price lists of market participants, in which different prices are defined for different places of delivery, it can be concluded that a greater distance of the place of delivery from the factory does not imply a higher selling price, and vice versa, which confirms the results of the conducted correlation analysis. On the other hand, in the case of one market participant who reflects the segmentation of buyers on a territorial basis through different percentage amounts of rebates, it was observed that regardless of the distance of the place of delivery from the factory, for deliveries in regions where the competition between producers and importers is more intense (the Belgrade region, as and the regions where the remaining two cement factories are located) grants a higher discount compared to the (closer) delivery points, where the competitive pressure is less pronounced.

Bearing in mind the different types and forms of rebates and discounts, which are approved on several grounds, while in most cases they are introduced by separate decisions, which are subject to frequent modifications, it can be concluded that the sales policies of cement producers and importers are extremely complex and insufficiently clear and transparent for existing and potential customers. On the other hand, the absence of a defined commercial policy for certain participants leaves the possibility for rebates and other discounts to be applied selectively, which can put certain market participants (customers) at a disadvantage compared to competitors and thus potentially limit competition.

RESEARCH PHASE II - THE CONCRETE MARKET

11. PRODUCTION OF CONCRETE

The term "concrete" generally implies a wide range of artificial building materials of the composite type, which are obtained by agglomeration of grains of different types of aggregates, with the use of certain binding substances. In view of the above, in principle we can talk about gypsum concrete, lime concrete, concrete based on water glass, asphalt concrete and other types of concrete.

Concrete is used to make roads, buildings, foundations, bridges, "stone" blocks, etc. The most widely used are concretes in which cement is used as a binder. Concrete hardens after mixing and setting, due to a chemical process called hydration. The water reacts with the cement, which hardens and binds the other components in the mixture, ultimately resulting in a hard "stone" material.

In construction, concrete is produced on the basis of a previously determined recipe, i.e. based on the design of the concrete mix, which should contain all the adopted amounts of component materials. The concrete recipe depends on the type of building, its elements, as well as on the applied construction technology. In addition to the basic components, various additives can be added to concrete that improve certain physical and mechanical characteristics.

According to the method of installation, monolithic and prefabricated concrete are distinguished. Monolithic concrete is installed in a liquid state on the construction site itself, where it is produced or delivered by trucks - mixers. Precast concrete is used for factory production of modular concrete structural elements (blocks, columns, panels, beams), which are then assembled on the construction site. Concretes are divided into light and heavy concretes according to their volumetric weight. There are also reinforced and micro-reinforced concrete, sprayed or shotcrete concrete, etc.

According to the data of the Republic Institute of Statistics, the production of fresh concrete in the Republic of Serbia had a growing trend from 2014 to 2019, a period during which, it doubled. In 2019, stagnation in production was recorded, so that in 2020, being the first year of the Covid 19 pandemic, a slight drop in fresh concrete production of 1% compared to the previous year ensued. However, already in 2021, the production of fresh concrete recovered, so compared to 2020, it has increased by 9%. Compared to 2014, the production of fresh concrete in 2021 achieved a growth of 127%.

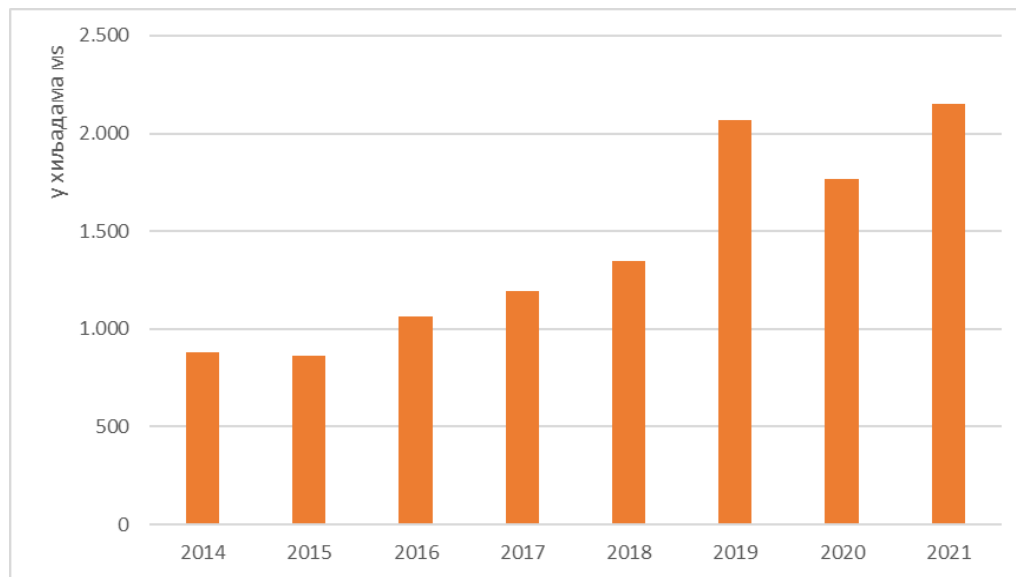
Table number 9 - Achieved production of fresh concrete (2014-2021)

| Year | Production | |
|------|------------|-------------|
| | tonnes | Chain index |
| 2014 | 98.184 | |
| 2015 | 929.085 | 116 |
| 2016 | 1.196.061 | 129 |
| 2017 | 1.268.518 | 106 |
| 2018 | 1.661.895 | 131 |
| 2019 | 1.675.047 | 101 |
| 2020 | 1.664.394 | 99 |
| 2021 | 1.816.280 | 109 |

Source: RSO - Statistical yearbook

Bearing in mind that the growth of the concrete market is directly related to the growth of completed construction works, the most important indicator of the movement of construction activity, the basic elements of the demand for the products in question arise from the value of construction works. Official statistics publish data on the value of construction work performed, which includes: the value of work, the value of installed material and finished products for installation, energy consumed and other costs related to the performance of construction work. According to the data of the Republic Statistical Office, the value of construction works in the Republic of Serbia has increased by 69% in the past four years, while in the period from 2014 to 2021 it has almost tripled. The growth of the construction industry in the past decade resulted in a significant increase in construction spending, which was reflected in all segments of the construction materials market, including the cement market and the vertically connected concrete market.

Chart no. 17 - Consumption of fresh concrete in the construction industry
(in thousands of tonnes)



Source: RSO - Statistical yearbook

Chart No. 17 shows the trends in the consumption of fresh concrete in the construction industry over an eight-year period. Based on the above, it can be concluded that the consumption of fresh concrete in the construction industry followed the growth of the construction industry and in the observed four-year period it increased by 60%, while compared to 2014 it increased 2.5 times. The decline in concrete consumption was achieved only in the first year of the pandemic, 2020, when a 4% decrease in the value of construction work led to a 14% drop in concrete consumption. In 2021, the construction industry fully recovered and achieved a growth of 29%, resulting in a 22% increase in fresh concrete consumption.

There are five types of concrete producers on the market of the Republic of Serbia:

1. Concrete producers who are also producers or importers of cement (Lafarge, Moravacem and Nexe);
2. Concrete producers who produce concrete for their own needs do not sell concrete and do not influence the market price of concrete (Napred, Energoprojekt, Mostogradnja, etc.);
3. Concrete producers who produce concrete both for their own needs and for sale on the market (Elita Cop, Sunce beton, etc.);
4. Concrete producers who produce concrete exclusively or mainly for sale on the market (Beton Plus, Karin Komerc, Armabeton, Gradient, etc.);
5. Companies that have ceded their capacity for concrete production to other companies, from whom they buy ready-made concrete and provide concrete transport and pumping services (LM komerc, Varda Sistem, Marmil, etc.).

If the production of concrete for own needs is excluded, which was not the subject of the analysis, almost the entire amount of concrete produced is, due to specific properties, simultaneously realized on the market, and the structure of the concrete production market does not deviate significantly from the structure of the sales market. In view of the above, below is a description of the structure of the concrete sales market on a selected sample that can be

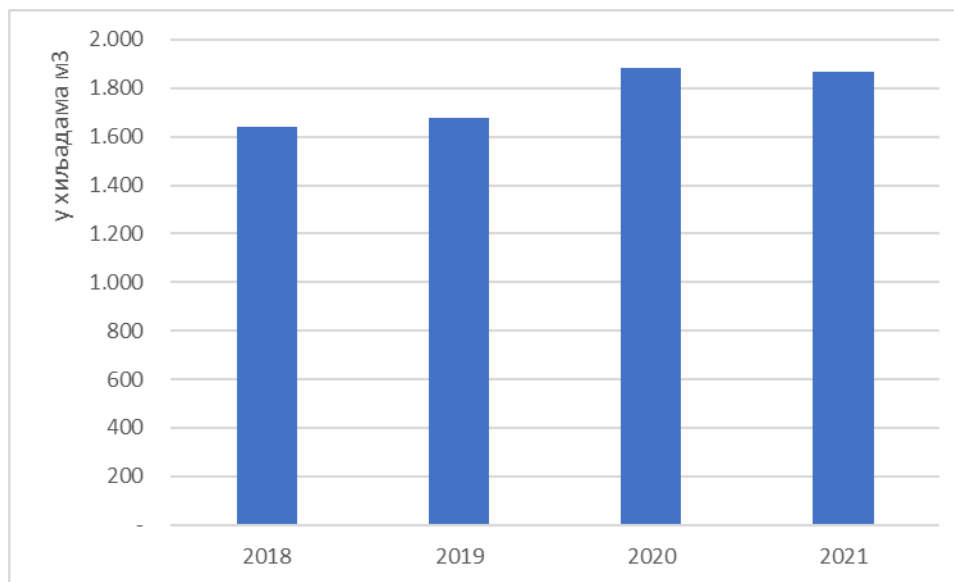
considered representative, bearing in mind that it includes all significant concrete producers in the territory of the Republic of Serbia, who produce concrete for sale on the market.

12 STRUCTURE OF THE CONCRETE SALES MARKET

The analysis of the concrete sales market is based on a sample of 25 concrete producers¹⁸, among which there are three vertically integrated companies - two producers and one importer of cement. By comparing the data on the total sales of concrete for the observed sample with the statistical data on the consumption of fresh concrete on an annual level, it was concluded that the statistical data underestimates the concrete market in two of the four observed years, while in the remaining two years, according to official statistics, the consumption of fresh concrete exceeded aggregate sales at sample level by 15-20%. Given that the subject analysis of the concrete market is based on a selected sample, and that it can be assumed that the total consumption of fresh concrete includes quantities that are not sold on the market, but represent production for own needs, in further analysis as data on aggregate sales of concrete, the data obtained by summing up the sold quantities for the observed sample of producers was used.

The total sales of concrete achieved by the covered producers on the market of the Republic of Serbia increased by 14% in the observed four-year period. The sale of concrete for the observed sample reached its maximum in 2020, and remained at that level in 2021.

Chart no. 18 - Sales of concrete on the Serbian market (2018-2021)
(in thousands of tonnes)



Source: CPC Calculations based on data from market participants

¹⁸ One of the interviewed participants stated that he does not buy raw materials (cement) for the production of concrete, but buys ready-made concrete from Lafarge company, which is produced at their factory, and then sells that concrete on to other customers. Bearing in mind that the production and sale of concrete at this participant's location was indicated by Lafarge, the quantities sold by the company [...] were omitted from the analysis.

In the concrete market, four participants stand out, which in 2020 and 2021 together accounted for about 60% of the total sales of concrete for the observed sample, while the first ten producers accounted for 87% of the total sales in the observed years.

Given that some of the producers included in the sample were not active in this market in the initial years of the observed four-year period, the following table shows the structure of the concrete market for 2021. Given the fact that there are other, smaller, locally oriented concrete producers appearing on the concrete sales market, who were not included in the sample, and that according to the official statistics, the consumption of concrete in that year was about 15% higher than it appears from the sample, the actual market shares may be slightly lower, but not to the extent that the market structure would deviate significantly from the one shown.

Table number 10 - Structure of the concrete market in 2021

| Market participant | Market share |
|--------------------|--------------|
| Beton Plus | /10-20/% |
| Lafarge | /10-20/% |
| Karin komerc | /10-20/% |
| Elita cop | /5-10/% |
| Nexe | /5-10/% |
| Moravacem | /5-10/% |
| Sunce Beton | /0-5/% |
| Armabeton | /0-5/% |
| SMB Betonjerka | /0-5/% |
| Betonska baza | /0-5/% |
| Others in total | 12,9% |

Source: CPC Calculations based on data from market participants

Based on the data from the table, it can be noted that there is only one cement producer among the top three concrete producers, while all three vertically integrated cement producers/importers are among the top ten. Of the concrete producers included in the sample, 19 produce only standard concrete, while the rest also produce other types of concrete.

The observed market participants own a total of 44 concrete factories, with eight producers owning more than one concrete factory. Fourteen concrete producers own factories in the wider territory of the city of Belgrade (a total of 24 factories), the factories of nine producers are located in the territory of Vojvodina (a total of 12 factories), while four producers own factories in the territory of central, eastern, southern and western Serbia (a total of 8 factories).

The radius of concrete delivery is usually in the range of 20 to 60 km (in rare cases up to 100 km), while the average delivery radius for the observed participants is about 40 km.

Table number 11 - Overview of locations of concrete mixers by region

| Belgrade and surroundings | Vojvodina | Other regions |
|---------------------------|--------------|---------------|
| Nexe | Nexe | Transkop |
| Lafarge | Lafarge | Neimar |
| Karin komerc | Karin komerc | Ralevic |
| Moravacem | Betonjerka | Euro Beton |
| Beton Plus | Beton BB | |
| Armabeton | Jela Trade | |
| Gradient 2021 | Pro Beton | |
| Marmil | Vikat | |
| ALK beton | MV Partner | |
| Sunce Beton | | |
| Betonska baza | | |
| ESB Beton | | |
| Elita cop | | |
| Beton IN | | |

Source: Data on market participants

Based on the data on the delivered quantities of fresh concrete of each of the producers from the sample in the territory of individual municipalities, the total delivered quantity of concrete by region was calculated. Of the total sales of concrete realized in 2021 by a selected sample of concrete producers, 65% was delivered in the territory of Belgrade and its surroundings, while 29% was delivered in the territory of Vojvodina¹⁹.

Table no. 12 - Concrete sales structure by region in 2021

| Regions | In % |
|-------------------------------|------|
| Belgrade and the surroundings | 65 |
| Vojvodina | 29 |
| Other regions | 0 |

Source: CPC Calculations based on data from market participants

In the territory of Belgrade and its surroundings, three concrete producers stand out - [...], [...] and [...], which together account for about 60% of the total sales in the Belgrade region. In the territory of Vojvodina, [...] and [...] stand out, which account for about 65% of the total sales of

¹⁹ It is assumed that the coverage of producers in other regions is smaller, due to the existence of a larger number of small, locally oriented concrete producers.

concrete, while the next two, [...] and [...], together make up about 20% of the total sales of concrete of the covered sample in this region.

Based on the above, it can be concluded that in the observed local concrete markets, the degree of market concentration is not negligible, despite the existence of a larger number of participants, and that the acceptable concrete delivery radius is an important limiting factor for the further development of competition in these markets.

13. ANALYSIS OF THE CONCRETE SELLING PRICES

The selling prices of concrete were analyzed from the point of view of the average weighted sale price, obtained on the basis of the submitted data of the concrete producers on the realized sale of concrete by quantity and value, and from the point of view of the official price lists of market participants.

Observed at the level of individual concrete producers for which the data for the four-year period was complete, four achieved a drop in the average selling price, while for the remaining producers the weighted average selling price increased in a range that ranged from 5-10% for most of them. The increase in the average selling price of the leading concrete producers generally did not exceed 9%. The lowest average weighted selling prices were [...], [...] and [...], while the highest prices were [...] and [...].

If, however, one observes the official price lists of concrete producers, delivered on request, a slightly different conclusion is drawn. Based on an insight into the price lists of fresh classic concrete at ex-works delivery terms, it could be concluded that in the observed four-year period, concrete prices were on the rise, and that most concrete producers increased the prices of fresh concrete in the range of 5% to 20%. Bearing in mind that the increase in basic selling prices according to the price list differs from the increase in average weighted (net) prices, possible reasons for such a deviation were considered. Analyzing the entire submitted documentation of the concrete producer, it was concluded that the said differences can be attributed to certain deductions from the basic factory price of concrete, which do not have to be contained in the official price list of the producer, given that the majority of deliveries are not made according to the official price lists, but the conditions deliveries are arranged in direct telephone contact with the customer or upon receipt of the order.

Namely, the concrete prices contained in the official price lists are expressed in EUR or RSD, most often without VAT, and differ depending on whether it is concrete of one, two, three or four fractions, with a smaller number of fractions corresponding to at a higher price and vice versa. In addition to classic fresh concrete, the price lists also contain special (higher) prices for pumped concrete, or the use of a concrete pump can be charged separately. Price lists can also contain prices for concrete with special properties, special concrete, concrete for concreting at low temperatures, etc. The price of transporting concrete by auto-mixers can be an integral part of the concrete price list or represent a separate price list. In the price lists, you can also find special prices for the addition of additives, the service of heating concrete in winter conditions (temperatures below 5 degrees), etc. For producers who have more than one concrete plant, prices can also vary from plant to plant.

The average selling price structure of concrete was obtained by averaging the values for each individual sales price item, based on the individual sales price structures provided by the concrete producers.

Table No. 13 - The average structure of the selling price of concrete

| Structure of the selling price | in % |
|--------------------------------|------|
| Costs of materials | 70 |
| Costs of transport and pump | 8 |
| Fuel and energy | 6 |
| Other costs | 7 |
| Margin | 9 |

Source: CPC Calculations based on data from market participants

In the structure of the selling price of concrete for all observed participants, the costs of materials (mainly cement) dominate, which generally make up between 60% and 80% of the selling price. The share of transport and pump costs in the selling price of concrete varies significantly between market participants. However, for most of the participants, the share of these costs does not exceed 10%, while for two participants, it makes up about 20% of the selling price of concrete. Fuel and energy costs for most participants do not exceed 5%, while for some participants they range from 8-14%. The producer's margin is usually between 5% and 10%, four participants showed a margin of around 20%, while one participant's margin was negative.

Based on all of the above, it was concluded that there are differences between the prices of concrete according to the official price lists of concrete producers and the average weighted sales prices, obtained as a ratio of the total sales value and the total volume sold, whereby the differences are manifested both in the price level²⁰ and in their dynamics during the observed four-year period. The weighted average selling price increased in a range that for most manufacturers ranged from 5-10%, while according to official price lists, the price increase of concrete manufacturers was up to 20%. Based on the analysis of the documentation submitted by the concrete producer, it can be assumed that the above deviation is, among other things, the result of increasingly intense competition on the concrete market, as a result of which concrete producers are forced to give rebates and other discounts, which are agreed upon in direct contact with the customer or upon receipt of the order, respond to competitive pressure, in order to retain existing and win new customers of concrete.

²⁰ which is expected, bearing in mind that the price from the price list is the gross price and is different for each type of concrete, while the weighted average price is the average net price

14 VERTICAL CONNECTION OF THE CONCRETE MARKET AND THE CEMENT MARKET

Unlike the demand for consumer goods which is finite, the demand for construction materials is a derived demand. The demand for cement stems from the demand for concrete, which is directly related to the demand in the construction industry. The dynamic growth of the construction industry led to growing construction consumption, which was reflected in both observed markets, in the form of production growth and the degree of utilization of existing capacities.

Cement is the basic raw material for the production of concrete, and reliability and continuity in the supply of cement, in addition to its price, are of crucial importance for concrete producers. This is supported by the findings of the conducted analysis, which showed that vertically integrated concrete producers are supplied with cement exclusively from their own sources. The remaining participants in the market mostly opt for one or two suppliers, usually cement producers, while several of them are supplied simultaneously by several suppliers, who can be producers or distributors of cement. The fact that vertically integrated concrete producers are supplied with basic raw materials from their own sources on preferential terms, i.e. at transfer prices, gives them a competitive advantage over independent concrete producers and allows them to offer concrete at a lower price than their competitors.

The choice of cement supplier is most often determined by the location of the cement factory, that is, the distance between the concrete factory and the cement factory. Based on an insight into the locations of concrete mixers, it could be concluded that concrete producers whose factories are located in the Belgrade region and Vojvodina are mainly supplied with cement by Lafarge and Nexe companies, while concrete mixers in the territory of central and southern Serbia are supplied by Moravacem and Titan companies.

The following chart shows the relationship between concrete producers and cement suppliers. The figure shows only concrete producers who are directly supplied by manufacturers, that is, cement importers, while those who are supplied with cement from other sources, that is, from distributors, are omitted.

Chart no. 19 - Structure of sources of cement supply directly from the producer/importer

[...]

Source: Data on market participants

If excluding three vertically integrated companies that are supplied from their own sources, three concrete producers declared that they are supplied with cement only from the company Lafarge²¹, while three producers each declared that they are supplied with cement from the companies Moravacem and Nexe. Six concrete producers indicated that they procure cement from two or more suppliers simultaneously, manufacturers or wholesalers, while only one producer indicated as a source of supply one of the cement importers that are not vertically

²¹ The fourth participant assigns the production plant to the Lafarge company, from whom it buys ready-mixed concrete.

integrated. On the basis of the above answers, it could be concluded that smaller concrete producers are supplied with cement mainly from wholesalers, while larger concrete producers usually opt for direct procurement from cement producers. This conclusion was also drawn during the analysis of the structure of buyers of cement importers, where it was stated that cement importers mainly or exclusively place cement on the market through wholesalers, who further supply final consumers, among whom concrete producers dominate.

Based on the comparison of annual data on the total value of cement used in the production of concrete, submitted by market participants, with data on concrete sales, it was possible to conclude that the purchase value of cement sold is on average 52% of the sales value of concrete, while for individual concrete producers, that share ranges from 39% to 76%. On the other hand, data on the consumption of cement in concrete production by quantity and value showed that the purchase price of cement increased by an average of 8% in the observed four-year period, while individual values ranged from 3% to 23%.

Bearing in mind that in the structure of the sale price of concrete, the price of cement participates with 50%, and often more, for concrete producers the increase in the price of cement implies an increase in business costs. The increase in operating costs puts pressure on concrete producers to pass the increase on to their customers, which can negatively affect purchasing relationships and make it difficult to acquire and retain new customers in a competitive market. In the light of the above, it can be stated that vertically connected market participants who are both cement producers and concrete producers are in a better position compared to independent concrete producers, who buy the basic raw material at the market price. A vertically integrated producer/importer controls and manages the distribution channel through economies of scale and bargaining power. [...] This conclusion is also consistent with certain empirical research in this economic sector, which showed a positive relationship between productivity and improved logistics coordination of producers, on the one hand, and the degree of vertical integration in the cement and concrete market, on the other hand²².

Gray cement is an interphase homogeneous product, with a high degree of substitution, where the costs of reorienting customers from one supplier to another are relatively low, so it would be expected that customers can change suppliers relatively easily and without additional costs. However, due to the economically justified distribution of products in a radius of about 300-350 kilometers, in practice the low costs of replacing suppliers in certain local markets are conditioned by the possibility of reorientation of customers to cement of imported origin. On the other hand, construction companies, as the most important buyers of cement, generally buy directly from producers, with whom cooperation is usually regulated by annual contracts. Due to years of cooperation and long-term business relationships, this category of customers is not inclined to change suppliers frequently.

The conducted price analysis showed that in the past four years, the average selling prices of cement of all producers and importers have increased by 8-13%, while the average selling prices of concrete have increased mostly in the range of 5-10%. Although according to data from the official price lists of cement producers and concrete producers, the prices of both products have increased by a significantly higher percentage, a general conclusion can be made that the

²² Ali Hortaçsu, Chad Syverson (2006), Cementing Relationships: Vertical Integration, Foreclosure, Productivity, and Prices, available at: <https://home.uchicago.edu/~syverson/virmcandcement3.pdf>

increase in the price of cement in the past period, and especially in 2021, has completely spilled over to the concrete market.

15 ASSESSMENT OF THE STATE OF COMPETITION BY THE MARKET PARTICIPANT

In order to analyze and evaluate the state of competition in the cement and concrete markets, market participants were asked to state their own view of the conditions of competition. In this regard, cement and concrete producers were asked to declare themselves regarding the existence of entry barriers or other obstacles that they believe have affected or may affect the development of competition in the relevant markets.

When it comes to the cement market, cement producers believe that there are no major administrative barriers on the market, which, according to their statements, is shown by the fact that a certain part of the domestic needs for cement is covered by imports, which are subject to minimum conditions, such as the necessary quality certificate.

Cement producers stated that cement is a product with a larger delivery radius compared to concrete, and therefore there are no obstacles for regional producers to access the Serbian cement market, which also have a better cost structure due to access to quality waste flows. One of the cement producers stated that cement production facilities require huge material investments of several hundred million euros each, while production costs require factories to be close to raw materials (surface mines), given that transportation costs significantly affect production costs and therefore on the competitiveness of producers.

Unlike cement producers, who consider that the conditions of competition on the cement market are satisfactory and that there are no obstacles to its further development, concrete producers believe that the cement market is not free and that, as one of the participants states, monopolistic behavior is present. One of the answers mentions the existence of agreements between cement producers in Serbia and abroad regarding the price, whereby, as this participant states, the margins of the largest producers are extremely high. He adds that the price of concrete is largely influenced by the price of cement and that cement and concrete producers produce concrete at very low prices, while on the other hand they maintain a high price of cement, thus making the margin of other concrete producers low. According to this source, the concrete market is under the influence of cement producers, where only certain concrete producers have privileged contracts with cement plants.

On the other hand, the participants mostly characterized the concrete market as competitive, and according to some estimates, there are over 20 companies engaged in the production and delivery of concrete in Belgrade alone. Explaining his statements, one of the producers stated that the production of concrete requires relatively small investments and flexibility in terms of organizing production. He stated that the raw material for production is available on the Serbian market, and the installation of mobile plants enables the optimization of production and transportation costs.

The participants stated that the concrete market is large enough and offers enough space for work, functioning and advancement, and the exceptional activity of the market leads to the improvement of quality and improvement of the work process in order for the market competitors to survive. On the other hand, one of the interviewees stated that the concrete market in Belgrade is dominated by three large participants with over 60% market share, which makes their impact on the market the greatest.

In addition to the conditions of competition, the participants involved in the analysis were asked to state their expectations regarding the further development of the cement and concrete market, with special reference to the potential of green cement and concrete. Based on the submitted answers, one can get the impression that the production of these products is increasingly moving towards ecological materials. In this regard, one of the cement plants states that more and more requests are expected for non-standard types of cement (resistant to frost and salt, sulfate-resistant, cements for high brands of concrete, binders for road stabilization, etc.). According to the participants, changes in local quality standards enable the specification and production of CEM II/C type cement with significantly lower CO₂ emissions. The participants state that they have already started selling cement of this type, while at the same time they are testing new products in an effort to make as much of the product portfolio as possible environmentally acceptable.

One participant stated that the trends in cement production are such that alternative raw materials are used for the production of clinker, in order to reduce air pollution, as well as alternative fuels, which reduces the share of fossil fuels. When it comes to concrete, this participant states that the trends are towards the production of concrete with cements that have a smaller proportion of clinker, and that the concrete has all the required properties. They also predict that in the near future recycled concrete will be increasingly used in the production of concrete, as a substitute for part of the natural aggregate.

Other participants spoke similarly about the conditions of competition in the cement and concrete market, emphasizing the growing potential of these markets, due to a large number of infrastructure projects, as well as residential construction. On the other hand, the participants state that the unstable political situation calls into question the supply of coal and gas, which are necessary for the development of cement factories, which can significantly affect the production of cement and concrete, their costs and, ultimately, the selling price.

Based on the answers provided, it was concluded that the market participants believe that there is less competition in the cement market than in the concrete market, due to the presence of three big players, who, according to the participants, can influence the price of cement and thus the price of concrete. The majority of participants believe that vertically integrated cement producers are in a privileged position on the concrete market, compared to independent concrete producers, because they procure the basic raw material, cement, under more favorable conditions, while vertical connectivity enables stability and continuity in cement supply. The participants believe that in the future these markets will develop in the direction of using ecological materials and alternative raw materials in accordance with the principles of sustainability and environmental protection, as well as that both markets have great development potential, with possible risks imposed by the current geopolitical situation on a global scale.

16 ANALYSIS OF CONTRACTUAL RELATIONS

In this part of the analysis, the focus was on the content of the contracts between cement producers, concrete producers and their customers, as well as the terms of operation.

16.1 Analysis of contractual relations between concrete producers and cement suppliers

In the course of the sectoral analysis, the Commission obtained and analyzed the contracts of concrete producers with cement suppliers (producers or importers) that were in force in the period 2018-2021, including all amendments, additions and commercial conditions that are an integral part of the contract.

By reviewing the contracts, the Commission concluded that the contracts of cement producers with customers are mostly typical and standardized, while the commercial conditions differ. Some contracts refer to price lists of cement suppliers, with rebate scales, while in some contracts and contract annexes the price of goods for a specific customer is agreed with rebates (sometimes several different types of rebates). It was also noted that some cement suppliers form offers to concrete producers depending on the specific project for which the cement is being procured, and the project itself is indicated in the offer.

During the analysis of the submitted contracts, no contractual provisions were identified, the wording of which would indicate competition infringement. However, the complex and insufficiently transparent sales policy of cement producers, and especially the possibility of selective application of rebates and other forms of discounts, can lead to limiting competition.

16.2 Analysis of contractual relations between concrete producers with customers

In order to see the overall picture of the market, the Commission collected and reviewed the contracts of concrete producers with the ten largest buyers of concrete, with all amendments, attachments and commercial conditions that are an integral part of the contract, for the purposes of sector analysis.

As with contractual relationships with cement suppliers, many of the contracts used by concrete producers are typical, whereby the commercial terms for the specific customer alter through contracts. The procurement of concrete is carried out as a standard for each individual project with terms of delivery, whereby the quantity and location of delivery are agreed upon for specific projects. It was also noted that contractual penalties for late delivery are often present in contracts.

Based on the analysis of the submitted contracts between concrete producers and customers, no provisions were identified that would in themselves cause concern to the Commission regarding the existence of potential competition infringements.

17. CONCLUDING CONSIDERATIONS AND RECOMMENDATIONS

17.1. Concluding considerations

- 1. The cement market is a very highly concentrated market, both in terms of available installed capacity for cement production, and in terms of the realized volume of cement production and sales.** The market has the characteristics of a classic oligopolistic market structure – a small number of participants with relatively stable market shares that operate profitably, on the supply side, and a large number of buyers, on the demand side, a homogeneous product and high barriers to entry into the industry. In an oligopolistic market with a homogeneous product, producers compete through prices, where they behave strategically, which means that when determining the price level, they cannot ignore the potential reactions of competitors, and such market structures are particularly conducive to the creation of explicit or tacit horizontal agreements between market participants.
- 2. The production of gray (Portland) cement in the Republic of Serbia has a growing trend and in 2021 it was 25% higher than the production in 2018, while compared to 2014, cement production increased by 60%.** The increase in cement production, in response to the stable growth of consumption at an average annual rate of about 10%, with unchanged installed capacity, led to an increase in the average degree of capacity utilization of cement plants from 60% in 2018 to 75% in 2021. The said trends in the production and consumption of cement warn that already in 2023, the capacities of cement plants could be insufficient to meet the domestic demand for cement, and in the coming period the Republic of Serbia could be dependent on imported cement.
- 3. The total sale of domestically produced cement in 2021 was 33% higher than the sales realized in 2018 and 67% higher than the sales realized in 2014.** Domestic cement producers sell on average about 95% of the total produced quantities to the Serbian market, while the remaining 5% is exported, with a tendency to completely redirect to the domestic market. Assuming that the entire imported amount of cement is placed on the market in the year of import, the share of imported cement in the total supply of cement did not change significantly and did not exceed 17%.
- 4. There are four participants in the cement sales market, three producers and one importer, who together account for 90% of the total sales of cement in the observed four-year period.** The market shares of producers on the sales market are relatively stable, they are somewhat lower but do not deviate significantly from their shares on the production market. The largest cement producer, Lafarge, has a stable market share of around /30-40/% throughout the observed period, while the market share of the largest importer, Nexe, does not exceed /5-10/%.
- 5. The growth of production and sales in the period from 2018 to 2021 was accompanied by an increase in the producer price of gray cement, and as the main reason, the producers cited the sharp increase in fuel and energy costs, which account for about 50% of the producer price of cement.** Average weighted sales prices of cement of producers and importers increased by 8-13%, and among cement

producers [...] had the lowest average sales price. On the other hand, according to the official price lists of the market participants, the producer prices of cement recorded a higher growth, which for certain types of jacketed cement amounted to over 20%. This deviation can be partly attributed to the complex rebate policy of cement producers, and the average net selling price obtained as a ratio of sales value to sold quantity, may be lower than the price list price. Also, cement producers who are also concrete producers deliver cement to their own concrete plants at lower, transfer prices, which further reduces the average weighted selling price of cement compared to the manufacturer's price from the price list.

6. **The origin of the cement affects the structure of customers and commitment to a certain distribution channel.** On average, cement producers deliver about 65% of the sold quantities directly to final consumers, while importers have a noticeable tendency to focus on one sales channel and they mainly market cement through a network of wholesalers. The average producer price of cement for the category of wholesalers was 5-10% higher than the producer price for the category of final consumers, which could be explained by the significantly higher total volume of delivery to the category of final consumers compared to the category of wholesalers and the fact that final consumers buy predominantly cheaper, bulk cement, although the shares of these two categories of customers in the total supply of cement can differ significantly between the producers and importers themselves.
7. **The geographical location of cement plants does not encourage competition between producers, because cement is a product whose distribution is economically justified within a radius of about 300-350 kilometers.** The conducted analysis indicated that there is a certain (although not precise) division of the market in the geographical sense between cement producers and that it is determined by the location of the factory. The most intense competition is in the Belgrade region, where all three producers and one importer are present, and the average price at CIP buyer delivery terms in the Belgrade region is lower than the average selling price at the same delivery terms in other municipalities, that is, cities.
8. **Sales policies of cement producers and importers are complex, insufficiently clear and transparent for existing and potential customers.** Cement manufacturers grant their customers various types and forms of rebates and discounts, on several grounds, and in most cases they are introduced by separate decisions, which are subject to frequent changes. The absence of a clear and transparent commercial policy leaves the possibility for rebates and other discounts to be applied selectively, which may put individual market participants (customers) at a disadvantage compared to competitors and thus potentially limit competition.
9. **The production of fresh concrete in the Republic of Serbia increased by 9% in the observed four-year period, while the total sales of concrete achieved by the included producers on the market of the Republic of Serbia increased by 14%.** Compared to 2014, concrete production more than doubled, while consumption of fresh concrete in the construction industry increased 2.5 times. In the concrete market, the first four participants in 2020 and 2021 account for about 60% of the total sales of concrete for the

observed sample, while the first ten producers accounted for 87% of the total sales in the observed years.

- 10. The distance of the cement plant from the concrete plant is the predominant factor on the basis of which concrete producers choose a cement supplier.** Based on an insight into the locations of concrete mixers, it could be concluded that concrete producers whose factories are located in the Belgrade region and Vojvodina are mainly supplied with cement by Lafarge and Nexce companies, while concrete mixers in the territory of central and southern Serbia are supplied by Moravacem and Titan companies. Larger concrete producers usually opt for direct procurement from one (closer) cement producer, while smaller concrete producers are supplied with cement mostly from wholesalers. Although vertically integrated producers are supplied with cement exclusively from their own sources, the analysis showed that only about 10% of the total sales of cement are delivered to related parties, and it can be said that cement plants rely, to a significant extent, on sales to third parties.
- 11. Concrete prices from the official price lists of concrete producers and average weighted sales prices, obtained as a ratio of total sales value and total sold quantity, differ both in nominal amount and in their dynamics during the observed four-year period.** The weighted average selling price increased in the range that among most manufacturers ranged from 5-10%, while according to official price lists, the prices of fresh classic concrete at ex-works delivery terms increased by up to 20%. Based on the analysis of the documentation submitted by the concrete producer, it can be assumed that the above deviation is, among other things, the result of increasingly intense competition on the concrete market, as a result of which concrete producers are in direct contact with the customer or after receiving the order, they agree on rebates and other discounts, in order to respond to the growing competitive pressure.
- 12. The selling price of concrete is dictated by the cost of the basic raw material (mainly cement), which accounts for between 60% and 80% of the selling price.** In the light of the above, internal procurement of cement at transfer prices gives vertically integrated producers a competitive advantage over independent concrete producers, who buy cement at market price, and enables them to offer concrete at a lower price than their competitors in the downstream market. The vertically integrated producer/importer controls and manages the distribution channel through economies of scale and bargaining power, and the analysis conducted showed that [...] have the lowest average selling prices of concrete have.
- 13. The concrete producers included in the sample own 44 concrete factories, of which 36 are located in the wider territory of Belgrade and in Vojvodina, where more than 90% of the total sold quantities of concrete for the selected sample are delivered at the same time.** In the observed local concrete markets, the degree of market concentration is not negligible, despite the existence of a larger number of participants, and the average concrete delivery radius of about 40 km represents an important limiting factor for the further development of competition in these markets.
- 14. Market participants rated the cement market as less competitive than the concrete market, due to the presence of three players who, due to their size and market**

power, can influence the price of cement and thus the price of concrete. The majority of participants believe that vertically integrated cement producers are in a privileged position on the concrete market, compared to independent concrete producers, because they procure the basic raw material, cement, under more favorable conditions, while vertical connectivity enables stability and continuity in cement supply. The participants believe that in the future these markets will develop in the direction of using ecological materials and alternative raw materials in accordance with the principles of sustainability and environmental protection, as well as that both markets have great development potential, with possible risks imposed by the current geopolitical situation on a global scale.

- 15. Contracts between concrete producers and cement suppliers, as well as contracts between concrete producers and their customers, are mostly typical and standardized, and based on their analysis, no provisions were identified that would indicate competition infringement.** However, vertical integration, non-transparent and selective commercial policy of cement producers can lead to distortion of competition in the relevant markets.

17. 2. Recommendations

When preparing the recommendations, the Commission took into account the previous findings and conclusions, and hereby gives the following recommendations:

- 1. It is recommended that producers and importers of cement make their commercial policies as precise and clear as possible for existing and potential customers.** The existence of complex, insufficiently clear and transparent sales policies leaves the possibility for market participants to negotiate rebates and other discounts in direct contact with the buyer, in which case the final price may be influenced by the buyer's bargaining power, i.e. its size and market power. By selectively applying the rebate policy, certain market participants (customers) can be put in a disadvantageous position compared to competitors, which potentially limits competition on the market. In addition, the practice of determining the prices of raw materials for specific construction projects, regardless of quantity or location, can allow suppliers of raw materials (cement) to have an indirect impact on the final costs of the project, and thus on the price per square meter to customers. The transition to more precise and clearer commercial policies, based on quantity and/or location, regardless of the identity of the customer or the specific project, could encourage competition between cement buyers, which would further positively affect all segments of construction activity.
- 2. Vertically connected market participants are recommended, and in particular those who are both cement producers/importers and concrete producers, to form cement transfer prices on a cost basis, taking into account the gross margin they realize in a transaction with an unrelated party.** The vertical connection in the subject market allows such participants to offer concrete at a lower price compared to independent concrete producers, who purchase the basic raw material, cement, at the market price, thereby reducing (squeezing out) the margin of independent concrete producers. Favoring

a related company, active in the downstream market, in relation to customers - direct competitors in that market, in a situation where the possibility of reorientation of the customer to an alternative supplier is limited, leads to an increase in the costs of competitors operating in the downstream market, thereby potentially distorting competition on both related markets.

- 3. Market participants are recommended to avoid behaviors that may influence the independent decision-making of other market participants, especially actions that could lead to the exchange of business data and information with other market participants directly and/or indirectly through associations.** Markets characterized by classic oligopolistic market structures are particularly suitable for coordinating behavior between competitors, which is why it is important that participants in these markets ensure neither to exchange commercially sensitive information, nor to send signals to competitors about price changes, and not to operate in a way that would could create collusion on the market.